

American Extended Deterrence and Allied Nuclear Non-Proliferation

Michael Callahan

Hofstra University

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Introduction

The emergence of nuclear weapons forever changed the dynamics of international politics, security strategy, and warfare. With the advent of new technology came the emergence of new theory and new policy to combat the overwhelming power nuclear weapons could hold in the international system. The possible spread of nuclear weapons capabilities to states across the globe, and the resulting individual decisions to proliferate or not, was received to mixed opinions by experts, viewing horizontal nuclear proliferation as either an equalizing, stabilizing mechanism for the international order or a disastrous, destabilizing tool that would allow states that possess them to upend the international order at the expense of possible global nuclear conflict. The United States has long held the view that horizontal proliferation, even among allies, is a negative, destabilizing force and should be prevented if possible. The concept of extended deterrence evolved as a way to ensure the protection of allied states through nuclear deterrence without those states developing nuclear arsenals of their own. The thinking has been that a state would not proliferate when covered by the American nuclear umbrella, but has that been reflected in history? This paper examines the history of the American nuclear umbrella through the lens of case-study states that pursued proliferation and whether the umbrella succeeded or failed in curtailing proliferation.

Structure and Thesis

According to the 2018 Nuclear Posture Review provided by the Department of Defense, the United States maintains at least 30 states under its nuclear umbrella, but does not name an exact figure nor does it list an extensive list of those states (“Nuclear Posture Review – 2018,” 35). By examining five states known to be within the American nuclear umbrella, this paper aims

to find that American extended deterrence is a positive force in the global non-proliferation initiative and has satisfied states that otherwise would have developed their own nuclear weapons programs. The states being used as case studies for this purpose will be Japan, South Korea, West Germany, Italy, and Australia. This paper will aim to argue that positive security assurances granted by the United States in the form of protection under its nuclear umbrella through NATO policy or bilateral treaty has been an effective tool in preventing further nuclear proliferation among allied states.

To be chosen as a case-study state, the state must possess the ability to construct their own nuclear weapons. Each of the states selected have either demonstrated their ability or are recognized to possess these capabilities. Each state must be an existing member of NATO or be party to a bilateral treaty with the United States securing positive security assurances through the American nuclear umbrella. Utilizing a series of proliferation models created by scholars in the field of proliferation studies to demonstrate why a case-study state would or would not have cause for proliferation and qualitative analysis of the individual histories and circumstances of each case-study will allow this paper to draw meaningful conclusions about the efficacy of the United States' nuclear umbrella as a tool to disincentivize horizontal proliferation among allied states. A sixth case will also be evaluated in this project, examining a state that deviated from the expectation of accepting American extended deterrence. France removed itself from the extended deterrent nuclear structure provided through NATO in favor of developing an independent nuclear weapons program. This case must also be examined closely to understand possible shortcomings in extended deterrence theory or in the real-world credibility and implementation of the American nuclear umbrella structure to determine why states might reject participating in such an agreement and seek their own nuclear weapons program. This paper

aims to show that the case of France was a deviation from theoretical expectations and that despite the horizontal proliferation of France, the non-proliferation efforts of the United States through their nuclear umbrella is still an overall success.

Research into the theory, implementation, and implication of nuclear proliferation and modes of dissuasion or prevention for further proliferation are as relevant today as ever. Recent comments by Turkish president Erdogan claiming that it is “unacceptable” that Turkey cannot have its own nuclear weapons brings Turkey, a long-time host of US nuclear forces through the NATO nuclear structure, to the forefront of this discussion (Sanger and Broad 2019). As the situation continues to develop in the coming months and the world begins to see the fallout and repercussions of Turkish aggression, Turkey can serve as an excellent example at the conclusion of this paper to reaffirm the continued necessity and importance of reflection and reevaluation of proliferation theory and non-proliferation and security policy as the world will watch in real-time whether these sentiments expressed by Turkish leadership develop into any policy changes and how these changes fit in accordance with the theories and policies discussed. All discussion of the current Turkish political situation and its relation to nuclear proliferation will be current up to March 1, 2020. As the situation is ongoing, this paper cannot account for political or military action taken beyond this date.

A review of previously-published literature conducting quantitative analysis of determinants of nuclear proliferation allows this paper to form an idea of under what conditions a state *should* be driven to seek out nuclear weapons. The articles that have contributed to this framework of understanding, when evaluated in concert, provide a robust overview of the numerous factors that must be considered in a state’s decision to proliferate and the actual weight each factor plays in going nuclear.

The structure of analysis conducted by Singh and Way in their 2004 article “The Correlates of Nuclear Proliferation: A Quantitative Test” will be adopted for this paper because it most clearly and simply demonstrates the complexity of this issue while also clearly defining a large set of independent variables. While the other studies examined each utilize similar independent variables in their analysis, Singh and Way offer a comprehensive selection of variables, allowing a proper understanding of the determinants of proliferation. The study by Singh and Way is also the most direct of the studies reviewed; they place equal importance on each of the possible determinants and aim to see which will prove significant, where the subsequent research focuses in on one determinant in particular. Bleek and Lorber’s research was also considered to serve as the baseline due to their expansion of the variables used in their modeling, but such an increase in variables made it much more unlikely for any one variable to achieve significance (Bleek and Lorber 2014, 440). Though their research will still serve as a critical portion of the understanding of proliferation, the simpler model of Singh and Way will serve as the baseline. Adopting the naming of variables and three-stage understanding of proliferation put forward by Singh and Way should not create bias as it is simply being used as a defined and consistent explanatory framework.

When describing the process of nuclear proliferation, it is important to not view “proliferation” as one single entity, where a state one day decides to construct nuclear weapons in a “bolt-from-the-blue”-style proliferation. Instead, there are three stages a state progress through in their quest for nuclear weapons: exploration, pursuit, and acquisition. Singh and Way devised this three-stage process to capture the nuanced actions states take in their development of nuclear weapons (Singh and Way 2004, 866). They allow a more descriptive picture to be created of the process of proliferation; instead of the black-and-white, yes or no question of

nuclear possession as the final discussion on proliferation, utilizing their three-stage model allows researchers to account for states that may have taken the first necessary steps toward a nuclear program, but for any number of reasons did not see it through to completion. The three-stage framework developed by Singh and Way that will be co-opted for this paper has also been utilized by a number of other quantitative analysis works, serving as a foundational framework for the evaluation of proliferation determinants.

The determinants that will be evaluated are categorized by one of three descriptors: technological, internal, and external. The discussion of these determinants will also expand on the underlying theory of why these factors are important, exploring various models and ideas of proliferation theory in search of an explanatory framework for why a state under certain conditions will pursue a nuclear weapon. The first to be considered will be the technological determinants. These factors will be used to understand the technological capacity and production capabilities of the state in question. The determinants in this category will be useful in determining whether a state exhibiting nuclear ambition possesses the technical ability to actually produce a nuclear weapon. The second category of determinants to be discussed will be the internal determinants. These seek to explain how political and economic conditions within the state inform the decision-making process of proliferation. The final set of determinants to be considered are the external determinants. These factors seek to demonstrate how a state's external environment influences its nuclear ambitions, understanding how external pressures from outside states, both allies and rivals, can shape a state's perception of its security and the necessity for an independent nuclear arsenal.

Together, these determinants will be found to have positive or negative values, where a positive value means a state under this condition will be more likely to proliferate and a negative

value means less likely to proliferate. Understanding the conditions *should* be driven to proliferate will prove vital to examining what factor influenced the state's decision not to.

Technological Determinants

Singh and Way propose three technological determinants to consider: GDP per capita, GDP squared, and Industrial capacity index. These factors seek to answer the question of whether successfully proliferating is even a possibility for a state, given the necessary and massive technical and financial expertise and investments.

Functions of GDP (per capita and squared)

GDP per capita was selected as a mark of technical ability because it is a more telling indicator of development within the state than simply viewing the GDP of the state itself (Singh and Way 2004, 867). The GDP squared factor is included to account for a possible curvilinear relationship between development and proliferation, which would be seen in states with nuclear ambitions beginning the process of proliferation once the minimum threshold of development has been surpassed (Singh and Way 2004, 868).

Industrial Capacity Index (Minimum threshold)

The Industrial capacity index studied in this research is a binary variable created for this model, aiming to determine a threshold of development that a state has either met the conditions of or not. Singh and Way argue states meet the necessary industrial threshold if the state maintains a domestic steel industry *and* if the state has “installed electric-generating capacity greater than 5,000MW,” (Singh and Way 2004, 868).

These variables are backed by the technological determinism model of proliferation.

Expanding the idea of the role technology and scientific communities can play in pushing a state

towards proliferation can help shape the model of proliferation known as technological determinism. A structuralist model, technological determinism sees nuclear proliferation as the natural, logical, and inevitable next step technologically and scientifically for nuclear-capable states. To forgo pursuing nuclear weapons while possessing the capability to construct them would be to act outside the expected behavior within this model. A technological deterministic approach would view nuclear proliferation through a supply-side lens, where the capacity to produce nuclear weapons is the driving force in doing so, rather than a demand-side lens, where the need for nuclear weapons for any number of reasons that could be accounted for in other models pushes a state toward proliferation (Futter 2015, 52). Through this model, the large majority of nuclear latent states have acted outside of the expected behavior by forgoing proliferation. One could also simply reject the logic and reasoning of this model, arguing that the historical evidence of states forging nuclear proliferation on a much grander scale than states that have proliferated proves that the model is faulty. However, if the base logic of this model is accepted – that states proliferate because they possess the ability to do so – then it could be used as a tool for examining the other forces and desires present in state decision-making and proliferation behavior that have led to an overwhelmingly prevalent trend of states acting against technologically-deterministic expectation.

States that are initially at a low level of development that begin to increase their level of development are found to have a significant risk of pursuing each of the three stages of proliferation, while states that already possess a high level of development are unlikely to pursue proliferation even if the trend of positive development continues. Singh and Way argue this as an example of the nuclear threshold – states that had always maintained desires to proliferate are only and finally able to do so once achieving the necessary level of development. For highly-

developed, non-nuclear states, they had already passed the threshold required for nuclearization and forgone it, so further development would not sway their decision (Singh and Way 2004, 872). These conclusions are repeated throughout subsequent literature, although more tempered in scope. We consistently find that variables defining state GDP and economic capacity maintain significant relationships with nuclear proliferation ending in nuclear possession, although often not with initiating a nuclear program itself (Jo and Gartzke 2007; Kroenig 2009; Bleek and Lorber 2014). Kroenig offers that this supports the notion of supply-side proliferation (Kroenig 2009, 171). However, the “supply-side” aspect presents a chasm between a nuclear program itself and seeing a nuclear program through to successful proliferation. Possessing a nuclear weapon is exceedingly more resource-intensive than just initiating a nuclear program, so the disparity in significance for factors examining economic capabilities would follow this logic. The economic barriers to nuclear possession are much greater than the economic barriers to nuclear exploration or pursuit (Jo and Gartzke 2007, 181). When questioning if and when states should be pursuing nuclear weapons, we should expect to focus on states that were undergoing periods of economic development and modernization. This can either be used in the vacuum of a technological determinist approach, that the developments themselves should drive the push for proliferation, or as a baseline for proliferation used in conjunction with other factors, assuming that states viewed as likely candidates for proliferation due to either external or internal pressures actually possess the capabilities to do so.

Internal Determinants

The internal determinants for proliferation are understood through various approaches and models of proliferation. Sagan details a second possible model of proliferation, this time seeking to examine the machinations of political decision-making within a state. Where his

security model simply viewed the state as a black box, only reacting to external stimuli within the interstate system, what he terms the Domestic Politics model allows a deeper examination of why a state, or more specifically, the individual actors in positions of power within a state, may pursue nuclear weapons beyond purely security needs (Sagan 1996, 63). Where the security model is blind to the role of the bureaucracy within the state, the domestic politics model puts bureaucracy at the forefront of discussion. The creation of coalitions by those maintaining vested individual interest in the state's pursuit of nuclear weapons, ranging from military leaders who would be able to exert more authority on the global and domestic stages to politicians whose constituents stand to gain economically from the infrastructure necessary to build and sustain a nuclear weapons program to scientists who seek the challenge (and continued laboratory funding) of developing the necessary nuclear arms technology for their government (Sagan 1996, 64). These coalitions account for the threats assessed within in the security model and can shape their policies accordingly, but the difference of this model is that threat alone is not the determining factor for proliferation.

Jacques Hymans advances the study of domestic politics as an engine for proliferation by focusing even more acutely on the individual leader of the state in question. Hymans in his Leadership Personality model seeks to reduce a leader to their most base worldview and their amicability in global competition, creating a four-boxed matrix in which all world leaders must fall. The leader's worldview is chiefly concerned with his or her state's position in that world. Hymans terms a "nationalist" leader as one who holds their state in high regard in the international system and a "subaltern" leader as one who recognizes the shortcomings and weaknesses of their state in relation to others. From the perspective of amicability, an "oppositional" leader presents the international system as a zero-sum game, where gains made by

other states necessarily mean losses for their own. A “sportsmanlike” leader is one that Hymans perceives to be less hostile to the advancement of other states, likely rejecting the realist notion of the zero-sum system. Of the four possible categorizations for a world leader, Hymans’ model projects that only a leader termed as “oppositional nationalist” would possess the necessary temperament and motivation to take the treacherous first step and lead their state down the uncertain path of nuclear pursuit. With this model, understanding the psychology of the leader alone can enable researchers to determine whether a state may proliferate given the necessary circumstances. If conditions are such that a state might gain benefits of having the security granted by a nuclear deterrent but the leader falls within one of the three other personality designations, that state will pursue other means of defense, such as a cooperative solution or seeking assurances of extended deterrence from a patron state (Potter and Mukhatzhanova 2008, 142-144).

The view of the nuclear bomb as a symbol of prestige for a state can also drive states in pursuit of the weapon. Simplistically, a state can hold the view that “great” or “powerful” states in the international system must possess nuclear capabilities and weapons in order to maintain their prestige as great or powerful. This explanation for why states go nuclear can work in concert with Sagan’s perception of the domestic politics model, as the need to uphold the prestige of the state can stem as much from internal pressures as external. On the international stage, nuclear powers are seen to be granted greater respect and sway than they otherwise might be. Possessing nuclear weapons alters the power of a state, and successfully proliferating in spite of the many barriers to entry and disincentives can elevate an otherwise weak state to notability and a state that must be contended with and placated in global conflict (Epstein 1977, 22). The origin of the correlation between “great” states and nuclear weapons is clearly entrenched in the

international regime. Looking at the United Nations Security Council, there are five states that are permanent members: the United States, the United Kingdom, France, Russia, and China. These five states are the same five states that are formally recognized by the NPT as being rightful and legitimate possessors of nuclear weapons.

Democracy and Democratization

The static variable of Democracy utilizes Polity IV data to determine the yearly status of democracy in the given state, while the dynamic Democratization variable is used to account for shifts in internal dynamics within the state. Where a one-year analysis of whether a state is or is not a democracy at that present moment can be useful in determining the internal climate, the more telling variable may be to observe as a state moves toward or away from democracy over a series of years. Singh and Way justify this notion by arguing that while we may see a state listed as a democracy in a certain year and we can draw conclusions from that information, a newly-established democracy may be more unstable or prone to aggression, which is valuable context that must also be considered.

They find a positive relation between democracy and each stage, indicating that democracies should be more likely to proliferate, although only the nuclear pursuit stage achieves significance. These findings are echoed by Jo and Gartzke (2007) and Kroenig (2009), but Bleek and Lorber (2014) find a lack of significance. The notion that democracies are more likely to attain nuclear-weapons status is based on the belief that politicians in a democracy will seek to garner support from the people and the bureaucracy, which initiating a nuclear program may aid in (Bleek and Lorber 2014, 437). Due to the aforementioned dilution of variables in the study by Bleek and Lorber, the significance of democracy as a positive factor for proliferation will be accepted, which lends credence to the Sagan's Domestic Politics model of proliferation.

Singh and Way did not include a quantification for the public sentiment regarding a state's proliferation and possession of nuclear weapons. Even in instances, where from a nuclear optimist's perspective, a state would be right and benefit from their decision to proliferate, the fear and outrage of the general public can derail efforts. Accepting the benefits of nuclear weapons as valid can often be a logical step too far for the public, and fears of political blowback and repercussions can dissuade politicians from pursuing this option (Woods 2002, 170). However, for the case studies, this paper will attempt to determine through examination of previous qualitative literature the public sentiment on nuclearization within each state in the period discussed. Understanding the culture and perspective of the state's civilians can add valuable information in the consideration of a state's decision to pursue or forgo proliferation.

Economic Openness and Economic Liberalization

The paper uses the state's trade ratios, "exports plus imports as a share of GDP," to examine the openness of a state to the global market for the codification of their economic openness variable, while the same view on the trending direction of that was taken for democratization is done for economic liberalization using the trend of the state's trade ratio (Singh and Way 2004, 870). Singh and Way find that internal economic factors may play a contributive role to a state's decision to pursue nuclear weapons. While they find no significance in their study of economic openness on any of the three stages, the variable for economic liberalization shows a significant negative relationship for the exploratory phase and a significant positive relationship for the pursual phase, though no significance for acquisition (Singh and Way 2004, 873). Both of these variables were coded with the intention of quantifying the state's involvement in the international economic system (Singh and Way 2004, 870). Yet in the great majority of subsequent literature, variables coded with the same intention consistently are found insignificant

in the decision to proliferate, as in the works of Jo and Gartzke (2007), Kroenig (2009), Fuhrmann (2009), and Bleek and Lorber (2014). For this reason, no significant relationship will be accepted for the economic openness internal determinants coded by Singh and Way. However, this paper accepts the logic presented by Etel Solingen in her argument that liberalization of a state's economy and its integration into the global market reduces the likelihood of a state proliferating. For this reason, the economic liberalization determinant is accepted to have a significant negative relationship with proliferation.

External Determinants

Enduring Rivalry

The enduring rivalry variable is a binary variable that evaluates yearly whether a state is engaged in a rivalry with another state, using David Scott Bennet, Jr's previously published coding of enduring rivalries in his 1998 "Integrating and Testing Models of Rivalry Duration," (Singh and Way 2004, 869). This variable will later be broken down into two separate variables, nuclear rivals and conventional rivals. The presence of a nuclear threat will likely cause a state to behave differently than threats from a state capable of only conventional weapons.

Conflict Involvement

The frequency of dispute involvement variable is determined by "5-year moving average of the number of militarized interstates per year in which the state is involved," (Singh and Way 2004, 869).

These two variables are backed by the logic of the security model of proliferation. The security model is the most basic reasoning of why a state would choose to pursue a nuclear weapon. A realist approach to the interaction of states, this framework stems from the need for

states to pursue self-help behavior due to the realities of the anarchic international system. The assumption is that states cannot rely on any outside actors for their security and continued existence; states must act in their own best interests to ensure that they possess the capabilities to deter attacks and defend themselves. In the nuclear age, nuclear weapons provide states that capability (Sagan 1996, 57).

At its most base form, this logic dictates that state A fears the nuclear or overwhelming conventional abilities of state B, therefore state A must develop its own nuclear weapon in response. Although State A staging either a preventive or preemptive strike against State B in the name of self-preservation is a possible course of action once it has developed a nuclear weapon, it is not the likely one. State A does not develop its weapon with the aim of using it against state B. Instead, accepting the validity and rationality of the logic of nuclear deterrence and the inevitability of mutually-assured destruction in nuclear conflict, state A hopes its nuclear capabilities serve as a deterrent against attack by state B. The fear of retaliation against their own territory prevents the aggressor state from launching an attack in the first place. Under the security model, a nuclear optimist hopes that continued proliferation, the spread of the nuclear bomb to a greater number of states, stabilizes the international system and can actually bring an end to armed conflict as states are paralyzed by their fear of nuclear retaliation (Jervis 1986, 692).

The explanatory framework of Sagan's security model details the expected cascade of nuclear proliferation that follow one state's nuclearization. A domino effect of states, that otherwise would have no nuclear intentions, pursuing nuclear weapons to match the newly-acquired strength of the first to proliferate should be seen if the question of state security were the only influencing factor in determining nuclear ambitions (Sagan 1996, 62). However, only

nine nuclear states exist today. While horizontal proliferation leading to this point can very well be traced and explained using the security framework of Sagan, it fails to adequately explain why the dominos stopped falling. Surely there remain non-nuclear-weapons states (NNWS) that both possess nuclear latency and fear a nuclear rival, so what other factors beyond immediate and self-reliant state security must be involved that lead to the state's decision to not proliferate? The security model will be used to choose case-study states by determining, using the logic of horizontal proliferation that stems from the model, which states *should* have pursued and acquired nuclear weapons and which states *did* pursue and acquire nuclear weapons. Using other models of proliferation in concert with the security framework is necessary to form a clearer view of the numerous forces a state must balance in deciding its nuclear path and help explain the discrepancy between those states that *should* and those that *did*.

Alliances and Security Guarantees

This variable seeks to understand how states within formal security alliances behave. Though Singh and Way only examine the concept through security guarantees, this paper will aim to present a comprehensive understanding of the alliances a state belongs to that would be relevant to their immediate security and the role of their participation in that alliance in the decision to proliferate. Within this understanding of security alliances, this paper will also examine how security assurances granted under a patron state's nuclear umbrella shape the path to proliferation for protégé states. Coding the United States, the Soviet Union/Russia, the United Kingdom, France, and China as Great Powers, the security guarantee variable determines the significance of defense pacts provided by a Great Power state to a weaker state as listed in the Correlates of War database (Singh and Way 2004, 869).

The security guarantees that this paper will focus on are positive security assurances through extended deterrence utilizing the American nuclear umbrella. The fundamental question that each state under the American nuclear umbrella asks itself when considering their nuclear posture is, “Would the United States willingly sacrifice Washington, DC or New York in the protection of Berlin, Tokyo, or Seoul?” In essence, the United States through their extended deterrence commitments is wagering that its nuclear credibility applies even to targets abroad under the nuclear umbrella. A rival of the USA will not attack a state under the US umbrella because that will trigger an American retaliation strike, but that in turn will result in retaliation against the United States itself. When credibility in direct deterrence is already so difficult to establish, credibly deterring attacks against foreign states by opening their own state to retaliatory attacks is even more difficult a task. The relationship between the patron state, the protégé state, and the deterred state in a multi-party deterrence dynamic can be a delicate balance. The calculations and goals of both the patron and protégé states must be examined to determine how extended deterrence partnerships continue to function in the modern international system and how they work as viable substitutes for further horizontal proliferation among allied states.

The introduction of a third state to a deterrence relationship complicates the logic of deterrence greatly and leaves much greater room for deviation from expected behavior in the event of a crisis. Although the basic logic of deterrence is still applied in these scenarios, each of the patron state, the protégé state, and the rival state have a new series of challenges that they must also factor in when determining the credibility of their postures. The patron state holds the greatest duty in demonstrating their resolve, ensuring the credibility of their extended deterrence posture. They must reassure their protégé states to ensure those states do not seek other means of

protecting themselves, such as proliferation, while also signaling their intentions and capabilities to the rival state, opening themselves up to possible attack. It is difficult to view the extension of credible deterrence through a theoretical framework; accepting a state's nuclear posture as credible is a very human decision, one that can be based as much in emotion and trust as in a theoretical understanding. Whether or not actions and policies discussed truly made an extended deterrence posture credible is unable to be known by those outside the positions of power, but historical analyses can reveal actions nuclear states have taken in their attempts to convince both allies and enemies that they are committed to following through on their nuclear security assurances.

Although guaranteeing security through an extended deterrence posture does open the patron state to greater risk of conflict, it does also grant the patron greater leverage over its allied protégé state, giving it greater leeway to enforce its will and ideals within the international community. While the very purpose of an extended deterrence relationship is to raise the costs of war when attacking the protégé state, this can provide the protégé an opportunity to act more aggressively than they otherwise would, knowing they have the protection of the patron state behind them. If a protégé state does feel secure within a patron's nuclear umbrella but still desires nuclear weapons for any of the many reasons discussed outside of their own security, the patron's deterrence may provide the protégé cover to proliferate without fear of rival repercussion (Monteiro and Debs 2014, 17). Such proliferation within the nuclear umbrella could damage the credibility for other states, possibly resulting in cascading proliferation, and could undermine the *raison d'être* of the nuclear umbrella itself. For these reasons, patron states must consistently reevaluate their defense relationships with protégé states and keep open their options for influencing protégé state behavior. In order to do so, states can take "carrot" or "stick"

approaches, either positive reinforcement for states acting in line with the desires of the patron state or negative reprisals for states acting out against the patron. Although both are intended as coercive behavior, the type of approach a patron state takes likely depends on the strength of the protégé state itself. “Carrots” resemble the ideas presented by the commitment theory; by granting extra strength to the protégé state through greater troop deployments, the patron reduces their willingness to pursue nuclear weapons of their own. This type of positive reinforcement is used with states strong enough to match the strength of their rivals and possibly pursue proliferation of their own. Attempts to punish a state relatively equal to its rivals could drive that state out from under the umbrella and inadvertently incentivize proliferation. “Sticks” are reserved for those states too weak to proliferate on their own, that are outmatched by their rival states in conventional capabilities, and rely on the patron’s deterrence for protection. In such a situation, the patron could threaten the protégé with abandonment, the nullification of their existing deterrence relationship (Monteiro and Debs 2014, 19).

The security model of proliferation presented in this paper’s discussion is clearly and directly supported by the findings of Singh and Way in their evaluation of external determinants. Dispute involvement and enduring rivalry each have significant positive relationships to each of the three stages of proliferation. However, this research finds that great power alliances lack significance in their relationship to proliferation. Despite the lack of significance in the relationship as per this study, we still find that states with a nuclear protector through an alliance have a much lower hazard rate of proliferation than states without such guarantees (Singh and Way 2004, 875). Subsequent studies largely dispute their findings of no significance, emphasizing the role of alliances and the benefits they can afford, in the form of information-sharing for a developing program or an extended deterrence relationship as a stand-in for further

proliferation. The findings of Jo and Gartzke are interesting in this regard. Expectedly, while a “nuclear defender,” a state granting the protégé state extended deterrence assurance, does not have either a positive nor negative effect on a state developing a nuclear program, it does show a significant negative relationship with nuclear weapons possession. They argue that nuclear umbrellas and nuclear defenders have a demonstrated effect in dissuading states from acquiring nuclear weapons (Jo and Gartzke 2007; 176, 186). Analyses showing that security alliances and guarantees are significant in a state’s decision to forgo nuclear weapons are repeated by Kroenig (2009), Bleek and Lorber (2014), and Monteiro and Debs (2014). Reiter (2014) reverses this logic by arguing that a state with no security guarantee will become more likely to proliferate, which supports this same idea. With the bulk of analysis showing significant, negative relationships between states possessing nuclear security guarantees and more broad security alliances and states proliferating, Singh and Way’s findings in this instance will be replaced. Bleek and Lorber’s research was tailored to determine the significance of security guarantees in a state’s decision to forgo proliferation. By diluting the significance of each by the introduction of additional variables, the continued significance of their security guarantee variable is a positive indicator for the acceptance of the thesis proposed by this paper (Bleek and Lorber 2014, 440).

States being threatened by a rival creates a precarious position for proliferation. The nature of the threat as well as the powers involved all influence whether said threat will push a state toward proliferation or not, possibly even deepening their resolve to maintain a non-nuclear position. Jo and Gartzke find that a state being threatened by conventional weapons will become significantly more likely to proliferate and Bleek and Lorber follow that study by displaying significance between conventional threats and all three stages of proliferation. We can infer why this would be the case using the basics of the security model. When two states are engaged in a

high-tension, threatening situation and only conventional weapons are involved, the introduction of nuclear weapons would immediately level the playing field and grant what was once the weaker state being threatened a viable deterrent threat that will prevent escalation and conflict. A state, even possessing more powerful conventional forces, likely would not act aggressively against a state with weaker conventional forces but also a nuclear arsenal.

While a positive relationship is found between conventional threats and proliferation, the same is not true for states being threatened by a nuclear power. Jo and Gartzke find a significant negative relationship between nuclear threats and proliferation while Bleek and Lorber find a positive significance between nuclear threats and nuclear exploration, but no significance between nuclear threats and nuclear pursuit nor nuclear acquisition. At first glance, this would seem counterintuitive. If states pursue nuclear weapons in order to level the playing field and give them the capability to stand their ground against a more powerful adversary with the reasonable comfort that they won't be wiped off the map, then why do we not see a significant positive relation between a state being threatened with nuclear aggression and that same state pursuing and acquiring their own nuclear arsenal? What better way to stand up to a nuclear rival than to develop your own nuclear capability? Researchers find that, in conflicts of this nature, the state being threatened has missed their window for nuclearization. States fear that displaying their pursuit of nuclear weapons may encourage their already-nuclear rival to launch a preventive attack, a nuclear strike aimed to preventing the target state from building up the capabilities to go nuclear (Jo and Gartzke 2007, 176). The twisted logic of the security dilemma, where attempts to increase your own state's security inherently decrease the security of other states, is displayed here. By attempting to acquire nuclear weapons with the hope of deterring a strike against them, a state may in turn induce a strike against themselves by incentivizing their rival to act rashly in

aggression before the second state can successfully equalize the power balance. This notion and the optimistic perspective that power of nuclear weapons act deterrence against conflict are not mutually exclusive. The introduction of nuclear actors into pending conflict is thought to greatly reduce the likelihood of escalation to violence and have a pacifying effect, with more nuclear actors creating greater stability, in the eyes of a nuclear optimist (Asal and Beardsley 2007, 151). However, the key detail with this understanding is that the states must already be established as possessing nuclear weapons. A nuclear state cannot act preventively against another already-nuclear state, but it can prevent a non-nuclear state from achieving proliferation. In cases such as these, we will hope to use qualitative analyses of historical case studies to find if states instead searched for a nuclear patron, resolving this power imbalance and insecurity without introducing the destabilizing effects of further proliferation.

Nuclear Assistance

This variable seeks to determine whether states receiving sensitive nuclear assistance, through “uranium enrichment, plutonium reprocessing, or direct weapons assistance,” would be more likely to proliferation than those not receiving outside assistance in the development of nuclear technology (Bleek and Lorber 2014, 436). The presence of nuclear assistance, even presented as strictly assistance for civilian nuclear capabilities is seen to have a direct significant relationship with nuclear proliferation. The phrase “Atoms for peace become atoms for war” rings true (Fuhrmann 2009, 40). Without delving too far into the technical details of uranium enrichment and the processes for enrichment of Low enriched uranium (LEU) for civilian use and Highly enriched uranium (HEU) for weaponization, we can acknowledge that states that possess the capability to enrich uranium in any notable capacity for civilian use simultaneously possess the capability to enrich it to the higher concentration needed for proliferation, although

the process will take much longer. By assisting nuclear programs in any form, the door opens for proliferation. As Kroenig notes, this is another supporting argument for the idea of supply-side proliferation (2009, 171). Kroenig (2009) and Fuhrmann (2009) both demonstrate and fervently support the relation between nuclear assistance and proliferation. This evidence demonstrates that “proliferation-proof atomic assistance” cannot exist; aid in civilian nuclear technology creates the opportunity for expansion into military nuclear development (Fuhrmann 2009, 39). In our case study reviews, we will aim to find historical cases in which civil or sensitive nuclear assistance was provided to our chosen states and how that may have altered the state’s nuclear course.

The Treaty on the Non-Proliferation of Nuclear Weapons (NPT)

This variable will be used to determine whether a state was party to the NPT during its coded period of nuclear ambition. This assumes that the NPT, which came into effect in 1970, was active during the period being discussed. For states whose nuclear pursuit took place before the advent of the NPT, this variable will be disregarded. Jo and Gartzke (2007), Fuhrmann (2009), and Bleek and Lorber (2014) all indicate that membership in the NPT regime significantly negatively correlates with proliferation. As with any treaty, though, states can choose to not sign or choose to withdraw their signature at any time, voiding responsibility to uphold the demands of the treaty, as is the case with each of the four “illegitimate” nuclear powers. India, Pakistan, and Israel haven’t signed the treaty and North Korea withdrew during their stop-and-go path to proliferation. South Sudan is the only other recognized state to have not signed the NPT, but for a great number of factors including an almost-certain lack in capability, they are not presented as a major concern for further proliferation (Sarkar and Ganguly 2018).

Expectations

This section will provide a summation of the previous discussion, indicating how determinant variables will be coded and understood moving forward in the case studies. The first set will be the technological determinants. When a country that was experiencing a level of low development begins to raise its level of development, this paper expects that country to be a likely candidate for nuclear proliferation. However, states that enter their nuclear exploration phase at an already-high level of development will not be expected to proliferate. These highly developed states will be expected to seek other means of security, be it through extended deterrence, increases in conventional capability, or other diplomatic processes.

Low level of development → high level of development: Positive

High level of development: Negative

The second set of variables discussed will be the internal determinants. Describing the conditions inside the state and the government, these help to explain how a state can be pushed toward proliferation from within rather than pulled toward proliferation do to security factors beyond its control. Whether or not a state is a democracy will be an important factor to consider. Democratic states will be expected to pursue proliferation. This does not argue the reverse, that non-democratic states will be unlikely to proliferate, but serves to indicate that the proliferation can be a result of pressures from within a democratic system. Economic liberalization is the second internal determinant to consider. As the state's economy liberalizes and becomes more interdependent on the global markets, the state will be more unlikely to proliferate. Autarky may more easily allow proliferation, but an economy reliant on trade and the world market may be

threatened by the diplomatic repercussions of proliferation, with the costs outweighing the benefits gained.

Democratic government: Positive

Economic liberalization: Negative

The third set of variables discussed will be the external determinants. These aim to depict how the international system and security conditions beyond the state's own control dictates a state's posture toward proliferation. This is also the most populated set of significant variables. First, this paper accepts the relationship between sensitive nuclear assistance and proliferation; states receiving nuclear aid will be likely candidates for proliferation. States belonging to the NPT, assuming the state's coded period of nuclear ambition is post-1968, will not be likely to proliferate, as doing so would violate the treaty. States belonging to security alliances will be less likely to proliferate and states party to security alliances that afford them coverage under a patron state's nuclear umbrella would be even less inclined to proliferate. Countries that are part of long-standing, enduring rivalries would be more likely to proliferate, but this factor requires greater specification. If the rival is a non-nuclear state, where the state in question would gain a clear advantage by proliferating, then proliferation is more likely. However, if the rival state is a nuclear state that would be able to prevent or preempt any attempts to proliferate, then the state in question would be less likely to do so.

Nuclear assistance: Positive

Membership in the NPT: Negative

Alliance: Negative

Nuclear Umbrella: Negative

Enduring Rivalry: Positive

Conventional threat: Positive

Nuclear threat: Negative

Case Studies

South Korea

The Republic of Korea presents an important and ever-present case of a state on the verge of nuclearization that through the outside intervention of the American military structure through the nuclear umbrella and constant presence of American boots on the ground has chosen to follow the path of nuclear restraint. For the purpose of this evaluation, South Korea has been coded by Bleek and Lorber as exploring nuclear weapons from 1969 and pursuing nuclear weapons from 1970, with all nuclear ambitions terminating in 1981. A historical analysis chronicling the political environment of South Korea following the Korean War and partition of the peninsula and the persistent threat environment Koreans have existed in since will determine why South Korea, with an aggressive and recently nuclearized rival directly on their border and two nuclear Great Powers within their spheres of influence, has never proliferated and constructed their own nuclear arsenal.

A contemporary commentary on post-war South Korean development highlights Korea as a success story of regrowth and development with a promising future as a contributor in the global inter-state system. Emerging from the Korean War, South Korea was initially viewed as a project necessitating massive American assistance to withstand the constant pressures of its communist northern neighbor, which by 1969, had been deemed a stark success (Chapin 1969). South Korea experienced an economic boom from the early 1960s to the early 1980s, a period

aligning almost perfectly with the years of nuclear ambition. An import-substitution model of economic development common to struggling, developing countries gave way in the early 1960s to an economy focused on exports and manufacturing, notably industrial manufacturing such as steel and iron (Kwan 1991, 6). This transition bolstered the Korean economy and allowed rapid economic growth while also creating both need for and capability to construct and expand necessary infrastructure, a key goal recognized early and prioritized by the Korean government (Kwan 1991, 12). With the growth in domestic industry and a special focus on steel manufacturing, South Korea easily meets the technological minimums established by Singh and Way as necessary for nuclear ambition. The trend of rapid economic growth in what begins as a poor state also aligns cleanly with Singh and Way's understanding of the technological determinants of proliferation, that rapidly growing and developing economies are more susceptible to proliferation than growth within an already developed economy (Singh and Way 2004, 872). The growth of the South Korean economy and their emergence as a world player in the economic sphere could be seen as either a positive or negative influence on their decision to proliferate. Their rapid growth was only possible due to the heavy intervention of the American government, forging a closer alliance between the two states that could help the USA as leverage to prevent Korean nuclearization. However, with economic growth, comes a greater sense of independence. Passing a threshold of economic strength to the point where American aid and intervention is no longer necessary to continue a healthy economy could provide the Korean government with the independence from the American patron they require in order to pursue nuclearization (Pepper 1978, 81). From the perspective of a technological determinist model, South Korea should have been a prime candidate for seeing their nuclear ambitions through to proliferation, yet history tells us that they did not.

The years between 1969 and 1981, the years of active nuclear ambition, were a turbulent period for South Korea in the domestic sphere. Spanning from 1963 to 1987, South Korea's political sphere was marred by conflict and militarism, leading to the dissolution of the Third, Fourth, and Fifth Republics of South Korea, ending in the establishment of the Sixth Republic that has survived to present day. Each of these former governments failed in democratic pursuits and devolved in authoritarian military dictatorships. While the autocratic nature of these regimes allowed the rapid growth and industrialization that quickly transformed South Korea into a global economic hub, they increasingly closed the Korean society and eliminated democratic institutions within. In the 1980s, the final decade in which Korean nuclear proliferation was a legitimate consideration as per the coding of Bleek and Lorber, the Korean economy experienced significant liberalization and nuclear ambitions were terminated in the early years of the regime that brought about these reforms (Hamilton and Kim 1993, 116). The liberalization of the South Korean economy can be taken into consideration when considering the economic health of the state and what effects proliferation might have. Economic liberalization opened the South Korean market to the world, and more importantly, the world markets to the South Korean industry. Moving toward proliferation could have drawn brutal economic sanctions that would cripple the blossoming Korean economy. For a dictatorship such as the regime of Park Chung-hee during this period, economic stability and health is vital to ensuring stability and security for the regime (Solingen 1994, 144). The possible negative effects on a liberalizing market due to punishments imposed by the international system as castigation for proliferation can provide additional context for why a state such as South Korea may not have proliferated during this period.

Having found democracy to be a significant factor that pushes states toward proliferation and determining that South Korea was at no point a democracy during its years of nuclear ambition, no political internal determinants can be used as reasoning for why South Korea would go nuclear. Although not quantified in a single determinant factor, the cultural view of nuclear weapons is another critical consideration when determining internal conditions and a favorable environment for nuclearization. During the period both prior to and during the Korean nuclear pursuit, South Korean society at large did not hold nuclear weapons with the same negative stigma that is seen in many other states, especially Japan (for obvious reasons) (Burr 2017). A lack of widespread, organized public outcry against nuclear proliferation could allow a state to view proliferation as possibly favorable, opening the window for their nuclear pursuit. A view of the domestic and political culture of South Korea during this period does not conclusively tell one way or another whether, based on the significant determinants of proliferation, the state *should* have proliferated, but it does make clear that conditions were so that it *could*.

Viewing the external determinants tells a different story that clearly outlines why South Korea maintained nuclear ambitions. Despite their accession to the NPT in 1975 under heavy international pressure, South Korea maintained a robust civilian nuclear program that was seen to give the Koreans breakout proliferation potential if they desired to do so (Burr 2017). South Korea's geopolitical condition from immediately following the Second World War to present day has been defined by the hostility and threat of its neighboring North Korea, backed by hostile China, and its alliance with and patronage by the United States as part of its containment policy in the region. The relationship between the United States and South Korea began when America aided in the defense against the influx of communist forces during the Korean War, rolling back and holding North Korean forces until the ceasefire and the establishment of the

DMZ. A formal military alliance was established between the two states following the end of the Korean War in 1953, agreeing to the US-ROK Mutual Defense Treaty. Allowing for the permanent deployment of American troops to South Korea, this treaty provided South Korea with defense against possible North Korean aggression and provided the United States a foothold in the region in order to protect not just their interests in Korea, but as a launching-off point for possible strikes against China or eastern Russia, an important tool in the greater American deterrence structure (Oh 2008). From the external determinants found to hold significance, a rivalry and regional threat stemming from the erratic and aggressive North Korea, at this time not yet a viable threat for proliferation, would indicate South Korea as a prime candidate for proliferation, explaining their exploration and pursuit.

If South Korea possessed the means to proliferate and a classic security model justification for proliferating, why did they stop at nuclear pursuit instead of seeing the process through to proliferation? The South Korean government could have withdrawn from the NPT and proliferated if they believed that was the best option for the defense of their state against an aggressive North Korean rival. The answer can be found in their reliance on American defense. Bleek and Lorber's 2014 coding assigns South Korea the label of nuclear exploration beginning in 1969 and nuclear pursuit in 1970, before ending their nuclearization in 1981. Examining the external determinants as causal factors in the context of the ROK-USA military alliance during this period will grant insight into why South Korea both opened and closed their window of proliferation within that 12-year span. American nuclear weapons were first deployed to South Korean territory in 1958, bolstering the credibility of American extended deterrence assurances in the relatively new alliance (Kristensen and Norris 2017, 349). With American weapons stationed in their territory, why did South Korea feel the need to pursue their own weapons

program? Uncertainties of the permanency of the American presence and the credibility of American commitments are the likely cause, indicating that an established, credible American deterrence commitment should be sufficient in quelling their nuclear desires.

The nuclear activity of the South Korean government directly coincided with periods where South Korea could have been left fearing American abandonment or questioning the American deterrent credibility. The withdrawal of American troops of the Seventh Infantry Division from South Korea in 1970 along with further troop withdrawals planned in the coming years combined with the warming of relations between the United States and China, marked by Henry Kissinger's "secret visit," likely sparked the pursuit phase of the South Korean nuclear program and is responsible for such a rapid escalation from exploration to pursuit. It wasn't until 1975 that the United States formally announced an acknowledgment of their nuclear weapons stationed in South Korea, seen as an attempt to reaffirm a Korean government that had grown to distrust the American deterrent posture's credibility (Roehrig 2017b, 125-126). However, it is the leverage the United States holds over its protégé allies that was able to coerce the South Korean government to pause and ultimately terminate their nuclear pursuit. Threats to remove American forces and invalidate previously-made assurances, abandoning South Korea, were the necessary tool to initially force the pause of nuclear pursuit and bring the Korean government to sign the NPT (Tertrais 2011, 4).

Following the South Korean accession to the NPT in 1975, the question of Korean proliferation was still not solved. Contemporary analyses of the USA-ROK alliance still made note of Korean fears of abandonment in light of plans for further American force withdrawals in the late 1970s. In turn, South Korea continued to make their will clear to their American allies, that the removal of American deterrence capabilities or the lack of credibility in their assurances

would force Korean proliferation in the protection of their own state (Betts 1977, 180). Park himself made these sentiments clear by communicating them to columnists Rowland Evans and Robert Novak of *The Washington Post* for a June 1976 column. As American troop withdrawals approached and President Carter considered the withdrawal of American nuclear forces, Korean nuclear pursuit began again, ultimately leading to the continued presence of American forces, acting as reassurance of the American commitment to deterrence. American nuclear withdrawal would be interpreted by their Korean allies as a lack of commitment to the security of the Korean state, necessitating horizontal proliferation (Hayes and Moon 2011). Instead, starting in 1978, the American government has made formal, public declarations reaffirming their commitment to the defense of their Korean allies, seeking to restore faltering credibility (Roehrig 2017b, 126).

Bleek and Lorber have South Korean nuclear ambitions coded as terminating in 1981. This date coincides with a change in government and a resulting change in nuclear policy. Following another military coup to seize power after the assassination of Park, Chun Doo-hwan gained control of the Korean state in 1980. One of the many policy changes enacted was the reform of the Korea Atomic Energy Research Institute (KAERI) in 1981 to reduce their scope of research and end their nuclear pursuit in a policy aimed at appeasing their American patron (Hayes and Moon 2011). In a sense, Chun's decision to ultimately bring Korean nuclear pursuit to a halt displays the intersect of how domestic and international politics can interact and inform each other. By gaining support of the American government through the termination of the Korean nuclear weapons pursuit, Chun stabilized and legitimized his own position of power in Korea. This instance is the clearest evidence that extended deterrence through the American nuclear umbrella has played a tangible, definite role in the prevention of allied proliferation. South Korean government officials made their desire and determination to proliferate in the

event of American incredibility or abandonment abundantly clear through both communication and action.

Since the end of South Korean nuclear ambition in 1981, the regional threat environment has only become more hostile for South Korea. North Korea has maintained an aggressive, antagonistic posture against the South and its allies. Despite multiple negotiations and agreements intending to rid the Korean Peninsula of nuclear weapons, designed to halt North Korean progression toward proliferation, North Korea has successfully proliferated and now possesses a functioning, threatening nuclear arsenal. Through these hostile years, South Korea has not exhibited proliferation behavior as coded by Bleek and Lorber. Recent years have seen some growing pressure for a new Korean nuclear program or for the redeployment of American tactical nuclear capabilities following the North's proliferation, but that has not manifested in any tangible change. Examining the post-nuclear-ambition South Korea and its experience under the American nuclear umbrella can explain how the continued deterrence provided by the USA has made it so that South Korea has not felt the need to once again pursue proliferation.

In 1991, all American nuclear weapons were withdrawn from South Korean territory. Though the withdrawal of weapons from the region was more largely intended as an American signal of decreasing hostilities to the collapsing Soviet Union, it still had great implications for the Korean security posture (Kristensen and Norris 2017, 349). With the United States upholding their extended deterrence commitments to its South Korean ally through other legs of the triad, the alliance was now free to negotiate with the belligerent North Korea over their consistent nuclear ambitions. With nuclear weapons removed, North and South Korea agreed in 1992 to the Joint Declaration of the Denuclearization of the Korean Peninsula, a positive step toward stabilizing the region and limiting the need for an American nuclear umbrella over Korea

altogether. However, this agreement failed to materialize in practice and none of the negotiated protections or policies were implemented (Carlin 2016). Following the Agreed Framework failure of the 1990s and the Six Party Talks failure in the early 2000s, North Korea began nuclear tests in 2006. Still, South Korea has not pursued their own nuclear arsenal as a means of deterrence. However, pro-nuclear sentiment among both the public and politicians may put more pressure on the United States to bolster their nuclear credibility or risk South Korean proliferation.

Polling has shown that up to 60% of Korean citizens support Korean proliferation, possibly opening the door for the government to do so with public support. Of course, South Korea would necessarily violate the NPT, the Comprehensive Test Ban Treaty, and the US-ROK Nuclear Cooperation Agreement, all of which they are party to, but if the unstable climate of American politics causes the South Korean government to lose faith in American commitments, they may prioritize state security over their duty to uphold their agreements (Lee 2019). South Korea has achieved nuclear latency and could bolt toward proliferation if changes in the regional security environment mandated it. There has also been a growing movement among Korean politicians requesting the redeployment of American nuclear weapons to Korean territory as a means of strengthening their deterrence against the North Korean threat, with polls showing public support for this action at 68% (Kristensen and Norris 2017, 354). Doing so could placate the nuclear hawks that have become increasingly popular in Korean society, but it could still agitate North Korea.

The discussion of whether the Republic of Korea will once again look toward proliferation has hinged entirely on the question of whether the Korean government views American extended deterrence security assurances as credible. This affirms this paper's thesis

that, in this case of South Korea, positive security assurances provided by American extended deterrence guarantees under its nuclear umbrella have been the determining factor in the non-proliferation.

Japan

When examining the case of Japanese nuclear ambition, special attention must be paid to historical and cultural influences that will inform the government's decision to pursue a nuclear weapon. As the only state to have nuclear weapons used against it in aggression, Japan presents a unique and important case study in how perceptions of the bomb can change drastically and how pervasive nuclear ambition can become. Bleek and Lorber's coding demonstrates two separate periods of nuclear ambition within the Japanese state under vastly different circumstances. The first ranges from 1941 to 1945, during Japan's time as an Axis Power fighting in World War II and terminating with the end of the war. Though Japan boasted a capable nuclear program during this period and made great strides in nuclear technology toward weaponization and proliferation, they were ultimately unable to successfully proliferate. For obvious reasons, this period of nuclear ambition will not be the focus of this case study. Instead, the second period of nuclear ambition, from 1967 to 1970 will be of central interest to this research. Discovering the political and external conditions that could lead a state, the only state victimized by aggressive nuclear force, to consider developing their own independent arsenal and ultimately terminate their nuclear pursuit will provide meaningful insight into the role of the American nuclear umbrella in promoting non-proliferation.

Before evaluating the significance of the determinants of proliferation to the Japanese nuclear case, this paper must first establish that Japan at the time of its nuclear ambition met the necessary minimum technological threshold established by Singh and Way that would allow

proliferation to be a technological possibility. Japan following the conclusion of the Second World War experienced a miraculous rebound in their economic and manufacturing sectors. In no sector was this “miracle” more apparent than the revitalization of the Japanese domestic steel production. Despite the lack of raw material available domestically, Japan was able to reintegrate its steel industry into the global market, returning its domestic steel production in 1953 to its mid-war 1943 height of 7.6 million metric tonnes per year. By 1970, the final year of coded Japanese nuclear ambition, the domestic Japanese steel industry was on pace to produce 85 million tons per year (Warren 1970, 329). The rapid growth of Japan’s steel industry is a result of aggressive investment into the technological and industrial redevelopment, spearheaded through the creation of the Ministry of International Trade and Industry (MITI) by the occupying powers following World War II, who saw a revitalized Japan as a powerful ally in the early Cold War against the growing Communist influences in the region and a key partner in producing the resources necessary to possibly fight a cold war turned hot (Elbaum 2007, 252, 256-7). This evaluation shows that Japan far surpasses the first standard of Singh and Way’s minimum technological threshold. The second of Singh and Way’s technological thresholds, electrical generation, was another key development area aggressively targeted by MITI. Powering such massive infrastructure development required massive power generation, far surpassing the minimum threshold established by Singh and Way.

The Japanese economic miracle from the immediate aftermath of World War II into the 1990s catapulted Japan from being a hollow shell of a former power following the collapse and destruction of its once-great empire to being a new global power, this time build on economic might and power in the global markets rather than imperialist growth. In the late 1960s and early 1970s, the period of Japan’s nuclear ambitions, the Japanese GDP grew by 12 to 13 percent

yearly, massive increases and a symbol of the rapid development of their industries. Fueled by manufacturing and the mass transfers of labor from agricultural to manufacturing positions, Japanese economic growth raised development levels throughout the country at an unprecedented rate (Kitamura 1971, 195-197). Rapid expansion of manufacturing capacity and the greater industrialization of the Japanese state before and during the coded years of nuclear ambition clearly indicate a significant possibility of proliferation, matching this paper's theoretical framework.

The establishment of a new constitution in Japan in 1947 brought about sweeping reforms, removing the supreme authority of the emperor and introducing democratic structures into the government. The new democracy relied upon the staggering economic growth and the use of that growth to elevate the status and quality of living of the Japanese people, as seen through projects such as Prime Minister Ikeda Hayato's Income-Doubling Plan announced in 1960, to stabilize the system and help cement Japan as a democratic state. Capitalism and democracy became intertwined in the new Japan, and as capitalism flourished, democracy was able to gain a stronger hold (Miller 2019, 230, 271-272). Although a single party, the Liberal Democratic party, has maintained a domineering presence in Japanese politics, the political system and society of Japan during the state's period of nuclear ambition could safely be considered democratic. Based on this paper's theoretical framework, this democratic structure serves as a positive factor in Japan's decision to pursue nuclear weapons.

Public perception of nuclear weapons has not been quantified into a single proliferation determinant, but no discussion of the domestic Japanese atmosphere in relation to nuclear proliferation could be complete without accounting for it. Japan is and hopefully will remain the only state to ever have nuclear weapons used against it in aggression. This experience informs

the Japanese perception of nuclear weapons and uniquely shapes the Japanese discourse around proliferation. A 1999 poll showed that approximately 90% of Japanese civilians felt an independent Japanese nuclear arsenal to be unnecessary (“Gallup Japan Poll...” 1999). Of course, much changed in the global security environment between 1969 and 1999.

Comprehensive studies of Japanese culture during the 1960s and 1970s demonstrate similar widespread anti-nuclear sentiments among the Japanese public. As a whole, Japanese society was and is vehemently anti-nuclear and any attempts to introduce nuclear weapons to Japanese territory, even by American forces at American bases located in Japan, have been met with massive public outcry and denouncement (Ota 2018, 197, 205). While technologically possible, this paper must consider whether following through on nuclear ambition would be culturally palatable for the Japanese people or whether it would be political suicide for those politicians leading the pursuit.

The rapid economic growth and industrialization of Japan throughout the 1960s also allows this paper to understand the liberalizing Japanese economy during this period. As a resource-poor state, Japan was dependent on global markets to purchase and consume their products, driving further development. While Japan looked outward to the global marketplace, domestic markets remained largely closed to outside foreign investment, allowing Japanese corporations greater ability to grow within the domestic sphere before emerging as multi-national corporations (Encarnation and Mason 1990, 25-27). The late 1960s and early 1970s saw Japan begin to open its markets to the world, but even by 1978, massive trade imbalances with key partner states like the United States existed (Abegglen and Hout 1978). Despite Japan’s own protectionism, the economy relied heavily on exports of manufactured goods, producing an influx of capital into Japan without which it would not have been able to maintain such growth.

Growing interdependence on the global markets should indicate that a state like Japan would forgo proliferation. Risking becoming a pariah state, subject to harsh sanctions that would thoroughly strangle an export-reliant economy like Japan's and losing the international status and prestige it had worked to regain following World War II, was a compelling force in preventing proliferation. Yet Japan pursued nuclear weapons anyway. Taking such great risk to the prestige and economic health of the state would indicate a great need for the weapons, motivated by security concerns as opposed to nuclearization being a state-funded vanity project following the idea that "great states have nuclear weapons." Through further evaluation of the external environment Japan found itself in from 1967 to 1970, these reasons may become more apparent.

The emergence of China as a nuclear state in 1964 dramatically changed the security environment for Japan. Now off the coast of two hostile nuclear-armed states, Japan was forced to reconsider its position under the US nuclear umbrella and look toward possible independent proliferation. Though theoretical findings would show that a number of external conditions present in Japan's case at the time of nuclear pursuit, including the declared viability of a rival's nuclear arsenal, where attempting to proliferate could draw preventive strikes against them, and Japan's participation in a military alliance and the consequent protection of the American nuclear umbrella, and the lack of a threat from a conventionally-armed rival over which a Japanese nuclear arsenal would gain a significant advantage, indicated that Japan would not be a prime candidate for nuclear proliferation, Japan's perception of its possible security needs led to its exploration and pursuit of a nuclear weapon. During the period of Japanese nuclear ambition, the government had not yet signed the NPT. It was not until 1970 that the Japanese government signed the treaty, though not fully acceding until 1976, signaling the termination of any nuclear ambition (Ota 2018, 203). Although Japan is seen to have begun receiving sensitive nuclear

assistance from France through aid in plutonium reprocessing technology in 1971, this falls outside the coded period of nuclear ambition and therefore will not be considered to have had a significant role on Japan's decision to pursue nuclear weapons (Kroenig 2009, 169).

Japan became formally covered by the American nuclear umbrella in 1951 upon the signing and 1952 enforcement of the Security Treaty Between the United States and Japan. This treaty formalized the commitment to demilitarization and strict self-defense laid out by the new Japanese constitution and specified the balance of Japanese facilities and American military power that would be necessary to provide Japan a credible defense (Dulles 1952, 179). The American nuclear commitment expanded in 1960 when revisions to the treaty under the Treaty of Mutual Cooperation and Security between the United States and Japan included secret nuclear deals meant to bypass the ban on nuclear introduction in Japan by allowing nuclear weapons on American naval ships "transiting" through American military installations in the territory (Ota 2018, 198). This level of nuclear commitment to Japan under the nuclear umbrella should, by this paper's theory framework, have been a major deterrent to Japanese proliferation. The hostile security environment Japan found itself in was a major pressure driving the decision to pursue nuclearization, yet many of the other external determinants explored by this paper's theoretical understanding of proliferation would indicate that Japan would forgo nuclearization.

The period of Japanese nuclear exploration and pursuit occur simultaneously, both beginning in 1967 and terminating completely in 1970 per the coding of Bleek and Lorber. The history of Japan's nuclear pursuit relies on the intertwining of two drastically different postures taken by the government headed by Prime Minister Eisaku Sato during this period. While publicly advocating for global denuclearization and establishing into Japanese law formal declarations of non-nuclearization, the Sato government covertly undertook studies to examine

the reliability of American nuclear deterrence and the feasibility of independent Japanese proliferation. Japan demonstrated its non-nuclear posture by the announcement by Sato of the Three Non-Nuclear Principles that have come to define Japan's status as a non-nuclear state. In a 1967 speech to the Diet, Sato formalized the non-nuclear posture and sentiment that had already been upheld by previous governments. The Three Non-Nuclear Principles determined that Japan would not produce, possess, or allow the introduction of nuclear weapons to Japanese territory (Kusunoki 2008, 37). This was a comprehensive and categorical rejection of an indigenous Japanese nuclear weapons program. Yet just one year later, Sato's Cabinet would be presented with the first of a two-part report examining the possibility of Japanese proliferation. The dichotomous view of nuclear weapons by the Japanese government in the late 1960s forces a complete review of the domestic and international influences driving Japan's apparent nuclear ambitions.

Understanding how Japan can at once both reject nuclear weapons outright while both relying on American nuclear capabilities for security and pursuing weaponization capabilities of their own presents a key challenge in determining the earnestness of Japanese nuclear pursuit and whether independent proliferation was ever seriously considered a political possibility by those in power during the late 1960s. This evaluation of the history of Japan's nuclear ambition will first seek to understand the security and threat environment of East Asia following China's successful proliferation and the political and security challenges that subsequently emerged for Japan. Next, this paper will consider whether Japanese proliferation through the development of an independent arsenal would have created a more stable, secure environment for Japan by providing greater security than the American nuclear umbrella was capable of. Finally, this paper will examine how determined Japan was to pursue an independent nuclear deterrent, how they

projected that determination to the world, and for what purposes beyond state security they might have done so, simply whether Japan truly desired a nuclear weapon or they wanted to use threats of proliferation as a bargaining chip. Through this evaluation, a more complete picture of the American nuclear umbrella's role in both Japan's nuclear pursuit and nuclear reversal can be considered.

The desire for a nuclear option was seen to emerge among Japanese political leaders following the recognition of China as a capable nuclear state. Japan was left to consider the credibility of American security assurances and nuclear extended deterrence granted through the 1960 Mutual Security Treaty in light of the elevated risk on conflict with a more powerful China. The elevated risk of rapid escalation between China and Japan may have caused American security assurances to lose credibility. In the late 1960s, would President Lyndon B. Johnson or Richard Nixon chance escalating global nuclear conflict, risking nuclear strikes on Washington DC or New York, to protect Tokyo? As American involvement in the war in Vietnam wound down, the policies of containment or rollback, signaling the American commitment to combat the spread of communism, were already being called into question. With the United States unwilling or unable to fully commit to rolling back communism in Southeast Asia, it is unlikely that they could be expected to do so when faced with nuclear weapons instead of guerilla forces. This perspective of Japanese security must consider how threatening the Chinese nuclear arsenal actually seemed to the Japanese in this period. Sino-Japanese relations appeared less hostile during this period than Sino-American relations, as demonstrated by economic and diplomatic cooperation like the 1962 Liao-Takasaki Agreement, formally the Memorandum Concerning Sino-Japanese Long-Term Comprehensive Trade. Through mechanisms established in this

agreement, by 1965, Japan was China's largest trading partner and China Japan's fourth largest (Hoadley and Hasegawa 1971, 146).

Growing economic interdependence and increasing diplomatic ties could have indicated a peaceful future between the two states. Yet, from the American perspective and from the perspective of many politicians in the Japanese Diet, Chinese proliferation signaled an existential threat to Japan. Even though Japanese nuclear ambition is not coded to have begun until 1967, sentiment that Japan should consider proliferation developed immediately after the Chinese nuclear test of 1964. A 1965 report published by an American governmental committee tasked with studying the feasibility of Japanese proliferation highlighted that influential members of the Japanese government, including Prime Minister Eisaku Sato, desired nuclear weapons to counter the Chinese threat. The report also concluded that Japan already possessed the technical capability to launch a weapons program and could explode a nuclear weapon as soon 1971 (Kurosaki 2017, 9-10). Sato even made Japan's nuclear ambitions clear to American president Lyndon Johnson, remarking in 1965 that, because the communists in China now had a nuclear weapon, Japan should have one too (Gavin 2004, 117). The development of a study within Japan's own government concerning Japanese proliferation underscores how Chinese proliferation motivated Japanese nuclear ambitions.

The results of the Japanese nuclear report studied by Sato's cabinet, though legitimizing Japanese nuclear ambitions, may delegitimize the idea that Japan was determined to successfully proliferate. The report was published in two sections, the first in 1968, concerning technical capabilities for Japanese nuclear proliferation (Kase 2001, 55). This technical report sought to understand how Japan could pursue plutonium weapons utilizing plutonium created through its civilian nuclear sector. Japan did not possess uranium enrichment capability at this time, so

plutonium was seen as the easier mode of proliferation (Kurosaki 2017, 7). However, unlike the American report from a few years prior, the Japanese study was unable to find a method of enriching plutonium for weaponization without violating safeguards placed on their nuclear industry by the United Kingdom, which would threaten continued nuclear assistance from the UK that had been crucial in developing the civil nuclear energy infrastructure (Kurosaki 2017, 9-10). Despite reservations over the technical capabilities of proliferation, the Japanese nuclear ambition continued through 1970. The completion of the second part of the report, this part concerning political and strategic concerns of proliferation, indicate the internally the end of nuclear ambitions for Japan.

The second part of the report composed for Sato's Cabinet in 1970 detailed the political and strategic ramifications of Japanese proliferation. This report detailed how proliferation would affect both Japan's status in the world and its security in East Asia and the reaction of the Japanese public that remained largely hostile to any nuclearization on Japanese territory. The report found that, due in large part to the protection of the American nuclear umbrella and growing tension between the Soviet Union and China, China would be unlikely to strike Japan to prevent its proliferation (Kase 2001, 61). However, the report also determined that proceeding with proliferation could isolate Japan diplomatically, possibly undermining the credibility of the extended deterrence assurances that would give them the cover to proliferate (Kase 2001, 59). A Japan already questioning the credibility of American nuclear assurances also hesitated to make further demands for American security for fear of portraying their doubts of the existing assurances, which could further weaken the relationship between nuclear patron and protégé (Kurosaki 2019, 16).

The 1970 report concluded that although Japan was technically capable of producing a nuclear bomb, doing so would provide little extra security and would be met with hostility both domestically from the Japanese population and internationally from both rival and allied states (Ota 2018, 203). Ultimately, the report finds that Japanese nuclear proliferation would be untenable and that continuing to rely on the security agreement with the United States established in 1960 would be the best course of action. Reaffirmation of the American assurances to Japan to protect Japanese security with the full complement of resources and weapons available through speeches by President Richard Nixon and Secretary of Defense Melvin Laird in late 1969 and early 1970 assuaged Japanese fears of abandonment and allowed greater comfort in the security of the nuclear umbrella (Kase 2001, 63). These commitments were fundamental in convincing Japan of its security, allowing Japan to sign the NPT in 1970 (Bunn and Timerbaev 1993, 12).

Japan may have seen nuclear ambitions as a tool for maintaining the non-nuclear status of its territory rather than as a determined pursuit for its own nuclear weapons. Strong American desires to stem further global proliferation, recognizing that Japanese proliferation could trigger further proliferation worldwide in states that feared falling behind in the battle for prestige, such as Germany, granted a small degree of leverage for Japan to utilize its nuclear ambitions to strengthen its bargaining position with the United States. Japan may have been demonstrating a catalytic nuclear posture, where continued nuclear latency with the threat of proliferation empowered it to gain greater concessions and commitments from the United States (Narang 2015, 77). In the instance of Japan, the island of Okinawa and preserving the non-nuclearization of Japanese territory remained a contentious issue throughout the 1960s until the reversion of the island to Japanese control in 1972. Following the occupation of Japan after World War II, the

United States maintained a military presence on the island of Okinawa. The reversion of Japanese sovereignty over territory occupied after the war was a major directive for the Sato government (Kusunoki 2008, 37). American nuclearization of Okinawa through deployments of nuclear weapons and the stationing of nuclear-capable weapons to the territory was a source of contention between the United States and Japan following the 1960 agreement. These concerns of nuclear deployments prompted Japan to take an active involvement in the maintenance of its non-nuclear status, serving as the catalyst for the announcement of Sato's Three Non-Nuclear Principles. The third principle, prohibiting the introduction of nuclear weapons to Japanese territory, targeted American nuclear deployments to Okinawa and Japan aimed to enforce this principle on the island, thereby exerting Japanese sovereignty over the territory. Despite this attempt, nuclear weapons were only removed from Okinawa following the reversion to Japanese control in 1972, when the United States respected the enforcement of the non-nuclear principles in the territory (Ota 2018, 197).

The catalytic posture of Japanese nuclear latency was seen as early as 1957, when Prime Minister Kishi Nobusuke considered the proliferation as a means to back up the Japanese demands for the reversion of occupied territory (Volpe 2017, 535). The continued nuclear latency of Japan proved useful in later discussions over Okinawa. Sato leveraged American fears of Japanese proliferation in negotiations with President Richard Nixon in 1969, accepting the reversion of Okinawa to Japanese control in exchange for Japan's signing of the NPT (Volpe 2017, 537).

The recognition that Japan was not in a position to proliferate as seen in the 1970 report and the deferment of Japanese security to the American alliance indicates the importance of the American nuclear umbrella in Japanese defense. However, it can be difficult to determine how

integral it actually was in preventing proliferation. If Japan were politically unable to proliferate, nuclear umbrella or not, then it would be misleading to say that the nuclear umbrella was responsible for Japan's non-proliferation. However, it was only from the relative security under the nuclear umbrella that Japan was able to come to the conclusion that the state was secure enough that the minimal gain in security was drastically outweighed by the negative repercussions of proliferation. Most of the substantive papers used for this historical review of Japanese nuclear ambition acknowledge that the American nuclear umbrella underpinned the Japanese security and defense structure, which allowed the freedom to consider nuclear pursuit in the first place (Kurosaki 2017, 12; Kusunoki 2008, 50; Ota 2018, 204; Kase 2001, 63-64). The American nuclear umbrella can credibly be recognized as one of, if not the most, predominant forces in keeping Japan from continuing its nuclear pursuit and reaffirmations of the credibility of American extended deterrence assurances can be credited for inducing the Japanese nuclear reversal.

West Germany

The West German nuclear ambition flashed for only a brief moment, but the American response to their nuclear exploration and pursuit was crucial in demonstrating the power and influence of the nuclear umbrella and served as a formative experience for American non-proliferation policy. Initiating and terminating concurrently, West German nuclear exploration and pursuit has been coded as lasting from 1957 to 1958, only two years. These two years will serve as an important period in maintaining the growing American role in the global non-proliferation regime. If West Germany were to have gone nuclear, it could have set off a chain reaction of proliferation among other European states and states worldwide that viewed themselves as global powers. Just a little more than a decade removed from the fall of Nazism in

Germany, a new German military power possessing nuclear capabilities could also have created fear even among NATO allies, raising international tensions and threatening the existence of the collective security that had come to stabilize Europe during the Cold War. This case study will examine the conditions that gave credibility to West German nuclear ambitions and the factors that made such ambition so short-lived.

To determine whether West Germany's nuclear ambitions were backed by nuclear capabilities, this paper must first determine if their industrial capacity exceeded the technological threshold established. Allied agreements at the Potsdam Conference had stated limits on the German steel industry as a means of controlling disarmament, establishing quotas well below 1938 production output. In following years as the need to rebuild and redevelop West Germany became clear and the United States funded massive reconstruction efforts through the Marshall Plan, these quotas were continually increased (M.G. 1952, 111). By 1951, domestic steel production in West Germany had not yet matched 1938 output levels, but was consistently trending upward and West Germany became a founding member of the European Coal and Steel Community the following year (M.G. 1952, 118). This clearly demonstrates that West Germany, by 1957, the first year of coded nuclear ambition, maintained a domestic steel industry, the first necessary threshold for proliferation capabilities. Between West Germany's role as a massive coal producer in Europe and a consumer of oil for energy production, with plans for national expansion into nuclear energy already being put into place by the mid-1950s intended to open in the 1960s, this paper sees that West Germany easily surpasses the second technological threshold, an electric-generating capacity greater than 5,000MW. With these two thresholds met, this paper can accept that West Germany was capable of pursuing nuclear weapons and possessed the technological ability to proliferate.

The devastation of Germany following World War II was widespread; industry was crippled, the Nazi regime left a governmental vacuum that required the Allies institute a new regime, and the population itself was nearly decimated. Combined, overcoming these factors proved critical for the rebuilding and redevelopment of the German state while ensuring a new streak of authoritarianism and rearmament would not be possible. As a state undergoes a period of redevelopment, its priorities and capabilities both shift as the development continues. Production capacity increases, spending capacity increases, and a state like Germany, a historical power, may look to reestablish itself once more on the global stage.

From a strict technological development standpoint, West Germany experienced miraculous economic growth and industrial development in the 1950s and subsequent decades, a phenomenon sometimes referred to as the *Wirtschaftswunder*, literally meaning “economic miracle.” Historical reviews of the state of West German industry following the war question the notion that German industrial capacity was significantly reduced due to the war. This position acknowledges that damage had been sustained by many factories and industrial centers, but they were functional again within a couple of years following the war. The critical infrastructure necessary for an industrial boom was already in place, but limited access to raw materials and capital served as the major obstacle. As these resources became more available as West Germany was reintegrated into the global economy, the economic miracle would appear to be a natural consequence (Stokes 1991, 8-10, 13). Even if the *Wirtschaftswunder* appeared inevitable with the benefit of hindsight and research into the industrial conditions of post-war West Germany, the immediate effects of the economic growth were felt by the German population at the time. During the 1950s, the GDP of West Germany grew at an average rate of 6.9%. Per-capita income of the West German people grew from 45% of American per-capita income to 67% through the

1950s, a rapid increase in development apparent to the people. The 1950s was marked by a massive reduction in unemployment (Hansen and Skak 2004, 82-85). These factors demonstrate a clear increase in level of development for West Germany in the years leading up to its coded period of nuclear ambition. From the technological determinist approach, this would indicate the conditions of technological development in West Germany were ripe for nuclear proliferation.

During the period of West Germany's nuclear ambition, the internal political atmosphere was a key factor in the state's nuclear pursuit and reversal. The Federal Republic of Germany, commonly known as West Germany as opposed to East Germany as the German Democratic Republic, came into being in 1949 with the institution of the Basic Law, the new constitution governing an independent, democratic, post-war West Germany. The Basic Law laid out the framework for a new democratic regime, ensuring West German politics would not experience a backslide toward authoritarianism. Konrad Adenauer was elected as the first Chancellor of the new West Germany, holding power from 1949 through his resignation from office in 1963 (Kellen 1966). This tenure places Adenauer in the seat of power during West Germany's brief nuclear pursuit and understanding his personal views on the security environment of Europe and the role of nuclear weapons will be key in determining the cause of pursuit and reversal. Immediately following the inception of West Germany's Basic Law through the present day, West Germany, and now Germany, has been categorized as a stable, free democracy. As determined by the analysis of quantitative studies, a democratic government serves as a positive determinant for proliferation, supporting the rationality of the West German nuclear pursuit.

Like Japan and France, West Germany was an economy undergoing massive rehabilitation and reconstruction following the Second World War. The German economy was heavily reliant on outside investment and the German government sought to reintegrate its

economy back into global markets, reestablishing the credibility of Germany as a reliable, friendly state. In the three years of massive American investment in Europe through the European Recovery Program, known as the Marshall Plan, from 1948 to 1951, West Germany received 11% of all funds, totaling about \$1.5 billion at the time (Tarnoff 2018, 8). In the 1950s, West German industry relied on the export of manufactured goods to bolster their growth and allow the continued technological development that would define the German economic miracle (Stokes 1991, 11). Between 1950 and 1970, West Germany had the greatest export value in US dollars in all of Europe, rapidly expanding their manufacturing capabilities and meeting the demands of the global market, fully integrating West Germany into the international economy (Hansen and Skak 2004, 88). The importance of foreign markets to the German economy cannot be understated. As the German economy liberalized and expanded beyond domestic consumption into a major global exporter, the likelihood of German proliferation occurring should have decreased. Heavy reliance on exports to support the national economy would indicate that the security gains made by successfully proliferating would not be worth the massive economic sacrifice due to subsequent sanctions and closures of the world market to German industry. Although the internal politics of a stable democracy in West Germany would indicate a positive likelihood of proliferation, the internal economic situation of heavily depending on exports would indicate the negative. An examination of the external determinants can provide a more whole view of the reasoning behind West Germany's nuclear pursuit and reversal.

The external security environment for West Germany during the late 1950s was a dynamic, threatening environment that could have driven the government to consider their nuclear pursuit. West Germany was the front line of the Cold War. The rift between East and West was more than just an ideology but a tangible border for the Germans, placing West

Germany at the very center of the global conflict. Though the German state underwent a period of disarmament following the conclusion of WWII, a new German military, with American aid, emerged in 1955 following its newly-recognized independence. With this independence and military force, West Germany entered into NATO, gaining membership in the collective security alliance aimed at balancing the military strength of the Soviet state and its satellites (Lockenour 2013, 41-42). With NATO partnership came coverage under the American nuclear umbrella, including forward deployments of American nuclear weapons to West German territory beginning in the mid-1950s in attempts to legitimize the American credibility in the eyes of West German politicians and encourage German non-proliferation (Fuhrmann and Sechser 2014, 462). With the looming threat of the nuclear power of the Soviet Union lurking on their border through its influence in East Germany, the West German relentlessness in their pursuit of ever more security assurances and greater involvement in the nuclear architecture of NATO is understandable. Nuclear sharing came to be seen as a central function in NATO during this period of heightened tensions with the dual purpose of securing West Germany and Europe while also ensuring there was no further nuclear proliferation in Europe, allied or otherwise (Bader 1966). The threat environment of West Germany in the late 1950s is very clearly understood. The West German state was a key nuclear protégé of the United States through NATO in their collective efforts to balance the power of the Soviet Union. While a prolonged rivalry such as West Germany's with the Eastern Bloc of Soviet influence would explain nuclear ambitions, its membership in a security alliance, its guarantee of security assurances through a nuclear patron's nuclear umbrella, and its rival being a nuclear state would all strengthen the argument that West Germany would not be a likely candidate for proliferation.

West Germany's coded period of nuclear pursuit occurred prior to the advent of the NPT, removing participation in the treaty as an external determinant to consider in this case. However, examining the circumstances of the German accession to the NPT in later years provides valuable insight into the attitudes within the German political system regarding independent proliferation and of their American nuclear patron. West Germany's hesitance to sign and accede to the NPT in 1969 and 1975 respectively was a contentious issue in the nuclear politics of Europe. Both the United States and the Soviet Union were very vocal in their opposition to an independent West German nuclear arsenal, viewing the possibility as massively destabilizing the relatively stable balance of power and peace between the two Cold War powers. In the buildup to independence and joining NATO, West Germany pledged "not to manufacture in its territory any atomic weapons..." a promise that would indicate a recognition of a long-term policy of non-proliferation, allowing the West German defense structure to plan its security knowing an indigenous nuclear weapons program would not be developed (Willrich 1966, 91). With this recognition of non-proliferation, one would expect West German accession to the NPT to be a logical next step. However, that was not to be. The hesitation was based on fears of restricting future security needs that could not be anticipated at that time. By signing the NPT, the German government would make it much more difficult for future German governments to successfully pursue proliferation if their state security environment made proliferation a necessity. Another major fear was that NPT membership would stifle the ability of the German nuclear industry to continue to develop and ultimately act as a technological exporter, diminishing both the prestige of West Germany and the economic functions of its industry. An economic approach to West Germany's NPT hesitation argues that security and desire to independently proliferate were not the central concerns; instead, concerns over the openness of the nuclear industry and the controls

on the flow of technology and capital were the main German focal points for refusal. Article IV of the NPT protects peaceful use and cooperation of nuclear energy and technology and these protections were emphasized upon Chancellor Willy Brandt's signing of the treaty (Romberg 2018, 3-4).

A security-centric view of the West Germany's accession to the NPT would argue that repeated and escalating pressure from allied powers like the United States and the inclusion of greater, more credible assurances such as the forward deployment of nuclear weapons acted to comfort West German security concerns and allow the acceptance of its non-nuclear status (Coe and Vaynman 2015, 993). Although historical studies disagree whether the United States overtly threatened abandonment if West Germany did not agree to the terms of the NPT, the possibility of abandonment still pressured West German decision-making in the nuclear realm (Schneider and Gerzhoy, 2016, 182-183). West Germany's participation as a founding member of EURATOM, signed into existence in 1957 and effective in 1958, provided civil nuclear assistance and cooperation between the nuclear-energy-capable European states in this period (Hines and Lowry 1986, 565). Participation in a nuclear assistance program would also positively support the case for West German proliferation.

The fear of German nuclear proliferation dates back before the fall of the Nazi regime and the split of the German state. The technology and knowledge developed during that nuclear pursuit during World War II did not simply disappear following the war and West Germany was not starting from scratch in their nuclear pursuit a decade and a half later. West Germany was born a nuclear-latent state, one whose possible proliferation deeply concerned both its allies to the west and its enemies to the east. Indigenous nuclear capabilities allowed West Germany to negotiate its place in the alliance from a position of strength, much in the same way seen with

Italy and France, though the latter felt its participation in collective security could not fully guarantee its own security. During the period of nuclear ambition, the United States undertook a strategy of a combination of diplomatic pressure and positive security assurances and strengthened guarantees to encourage West German non-proliferation and ultimately West German accession to the NPT.

The coded starting date of German nuclear ambition in 1957 aligns with preliminary talks between West Germany, France, and Italy to develop a shared nuclear arsenal between the three states. The coded date of 1958 aligns with the cessation of these talks and the collapse of the tripartite nuclear planning when Charles de Gaulle came to power in France and nullified the progress, instead opting to pursue an independent French arsenal unrestricted by any partner states, once again leaving West Germany under the nuclear patronage of the United States (Gerzhoy 2015, 110). The steps taken toward reaching this agreement were the only concrete actions toward proliferation that reach the threshold of at least nuclear exploration.

Even before West Germany and France made formal agreements to mutually work toward nuclear proliferation, Konrad Adenauer, despite his previous swearing off German proliferation, began to explore nuclear options. Doubting the credibility of American security assurances, Adenauer felt that West Germany must look to secure its own protection in the event the United States could not be counted on in a conflict (Burr 2018). Following a study revealing staggering casualty totals to the German people in a conflict involving the Soviet Union and the United States and an American directive to rely more heavily on their nuclear deterrent in Europe as a means of maintaining security, Adenauer doubted American credibility and ability to protect German security in conflict. Reversing his previous posture that West Germany was committed to non-proliferation, Adenauer proclaimed nuclear ambitions for West Germany on

the basis that Germany must ensure its own security (Monteiro and Debs 2014, 43). Italian and French nuclear proliferation considerations are examined in separate case study discussions, but for West Germany, the desire to proliferate seemed to arise from a genuine fear of abandonment rather than a catalytic posture.

The FIG (France, Italy, Germany) project was seen as a rejection of the American domination of European security and at the very least a demand for greater representation and authority in the decision-making structure of NATO and in the nuclear strategy covering Europe (Nuti 1993, 120-121). This plan would exchange “German money and expertise for access to the nuclear warheads eventually developed under French leadership,” giving the West German military greater control over its own nuclear policy. West Germany proceeded with this plan despite securing very strong nuclear-sharing and extended deterrence agreements with the United States, going so far as to have almost de-facto control over the American nuclear weapons stored in German territory (Gerzhoy 2015, 110-111). When de Gaulle terminated the French participation in the agreement in 1958, Adenauer was left to decide between relying on the American nuclear umbrella or setting out on the path to proliferation alone. With German nuclear ambitions also terminating in 1958, this paper can conclude that Adenauer chose to rely on American nuclear guarantees.

As previously discussed, West Germany did hold out onto nuclear aspirations until their signing of the NPT until 1969, using the catalytic nuclear strategy of holding the threat of proliferation as a means of securing greater assurances and guarantees. This was seen through the proposal of the multi-lateral force (MLF), which would have been a more substantive nuclear sharing arrangement including West Germany and the United States (Coe and Vaynman 2015, 989). West German nuclear reversal was a result of their abandonment by their French partner in

the pursuit of a joint nuclear program. However, West German fears of abandonment prompted by sometimes explicit, sometimes implied threats of abandonment by the United States have kept West Germany non-nuclear. West Germany would have been thoroughly outmatched by the Soviet Union if not for the protection and extended security the United States afforded it in the 1950s, 1960s, and beyond (Monteiro and Debs 2014, 46). The overwhelming threat of Soviet aggression in response to German proliferation paired with likely American abandonment in protest of German proliferation ultimately kept West Germany non-nuclear. Throughout the 1950s and 1960s, West Germany questioned the credibility of the American nuclear umbrella, but in this case, it was wielded quite effectively as a tool enforcing the non-proliferation regime.

Italy

Italy presents an interesting study of the possibility of horizontal nuclear proliferation by a NATO state and the role both American security assurances and NATO nuclear policies regarding the common security of its members guaranteed largely through American defense capabilities can serve to prevent that proliferation. As per the coding provided by Bleek and Lorber's study, both the exploratory phase and pursual phase of the Italian nuclear weapons proliferation effort formally began in 1955 and soon terminated in 1958. Among the quantitative literature reviewed, there has even been disagreement among scholars on whether or not Italy ever truly exhibited proliferation behavior. As noted, the coding by Bleek and Lorber has been designated as baseline for this paper due to their robust categorization. Singh and Way, however, note Italy as a "Dog that didn't bark," a state in which conditions were such that the state *should* have pursued proliferation but did not do so. The predicted years of possible predicted hazard range from the "1950s to early 1960s," similar in range to the coding of Bleek and Lorber (Singh and Way 2004, 880). Further analysis of the state of Italian nuclear ambitions in the years

between 1955 and 1958 can provide better insight into why such a discrepancy exists. With such a small window of time in which the Italian state took acted as a proliferating state, this paper must examine the rapid response of Italy's NATO allies and the response of the global community as a whole to consider why the pursuit was terminated so shortly after it began. Following that, an overview of Italian state security and its relation to the American nuclear umbrella in the proceeding years until present day will help exhibit why Italy has not pursued an independent nuclear deterrent since and if American extended deterrence was can be found to have had a causal effect or if Italian nuclear restraint can be credited to other influences.

Though Italy has completely phased out nuclear energy production and shuttered their once-functional nuclear plants following a 1987 referendum on the future of the nation's nuclear power, Italy once boasted a functioning, growing civilian nuclear industry. With civilian capabilities comes proliferation concerns, as the foundation for nuclear weaponization has already been laid and proven functional. Though nuclear energy production facilities did not come online until the early 1960s, the Italian nuclear sector played a leading role in the advancement of nuclear technology and knowledge, with the foundation of the National Committee for Nuclear Research (later renamed the National Committee for Nuclear Energy) in 1952 and the commissioning of Italy's first research reactor in 1959 ("Nuclear Energy in Italy" 2018). While the dates of actual nuclear energy or research production do not align directly with the years coded as Italy's period of nuclear pursuit, this paper can still hold that proliferation was a concern. Nuclear proliferation is an extended, multi-year process. By building the institutional foundation and infrastructure for a nuclear industry before and during that period from 1955 to 1958, Italy was perceived as a threat to proliferate in the future. The expectation is not that they

should have successfully achieved proliferation in that window, it's that they'd have made positive movement toward weaponization.

Italy's nuclear aspirations were made possible by the post-war economic recovery sometimes referred to as the "Italian miracle." GDP and per-capita GDP grew at 4.62%/year and 5.29%/year respectively from 1951 to 1973, a rate far beyond any other period in Italian history since unification in 1861. This economic boom allowed Italy to catch up the European average for GDP (Malanima and Zamagni 2010; 2, 5). Rapid post-war industrialization and the early stages of European integration also allowed Italy to easily clear the technological threshold established by Singh and Way in order to determine the feasibility of a state's proliferation by bolstering their domestic steel industry and their electrical production capacity. In the 1950s, the Italian energy sector was dominated by hydroelectric production, having been a valuable source of energy for the Italian state since the 19th century and placing Italy among the top producers of hydroelectricity in all of Europe by 1960 (Bartoletto 2013, 38). The domestic energy industry of Italy far exceeded Singh and Way's 5,000MW production capacity threshold by 1950.

Italy's participation as a founding member of the European Coal and Steel Community also ensured the security of its domestic steel industry. Between 1952 and 1961, the production of steel in Italy nearly tripled, rising from a 3.5-million-ton steel output to a 9-million-ton output, the fastest industrial growth in the ECSC during this period (Kipping, et al. 2013; 85-86). The growth and stabilization of the Italian domestic steel sector also qualifies Italy as meeting the technological threshold established by Singh and Way by the early 1950s. Acknowledging this, this paper can move forward with the case study of Italy under the assumption that Italian nuclear proliferation was at that period a technological possibility. Not only was nuclearization a technological possibility, states such as Italy rising from the ashes of the defeat of World War II

experiencing massive economic growth and industrialization, as established by their rapid GDP and per-capita GDP growth, while looking to re-establish their place in the hierarchy of the international system as a nation reborn and rebuilding would be, following the evaluation of the technological determinants deemed significant for proliferation, a natural environment for the proliferation of nuclear weapons.

Following the fall of the Italian Fascist state, a new government was needed to rebuild the Italian society. In the place of fascism rose a fledgling democracy, constantly at battle with internal forces threatening backslide into authoritarianism. The ruling Christian Democrats struggled with the pulls of communism and socialism that maintained great popularity in Italian politics, but the democracy of the Italian Republic established following the 1947 peace treaty and the enactment of the 1948 Constitution was able to find stability and come to define the Italian state (Saragat 1950). With support from foreign states, namely the United States, the Christian Democrats maintained a hold on Italian politics until 1994, when they were unseated by Silvio Berlusconi's center-right alliance. The Christian Democrats received so much external support because the main political opposition for decades in Italy was the Italian Communist Party. Foreign intervention and interference in Italian politics in support of the Christian Democrats by the western world was a small part of the Cold War political maneuvering aimed to ensure the interests of the United States and the capitalist system won out over the Soviet Union's political interests in Europe (Müller 2013, 83). Nonetheless, the young Italian democracy was just that: a democracy. The dynamic of one party in control for such an extended period of time, especially due to the influence of a foreign power, that foreign power being the state's nuclear patron, will require further examination when discussing the history of nuclear

policy and proliferation in Italy, but the internal determinant of democracy is positively found in Italy during the 1950s, the period for which it was coded as exhibiting proliferation behavior.

The cultural perception of nuclear weapons can add context to the domestic conditions of Italy during its nuclear pursuit. Although later polling in the 1980s depicted an Italian society strongly against the global nuclear arms race of the Cold War and largely in favor of arms control, the Italian public at large during the late 1950s and early 1960s possessed a relatively indifferent view of nuclear weapons and the growing arms race (Russett and Deluca 1983, 188). This indifference bordering on ignorance of the issues arising in the global nuclear sphere was seen to be specifically an Italian phenomena, with the Italian Army's Chief of Staff maligning the public as uninformed and unmotivated to learn, distinguishing their disinterest from the intense interest in nuclear issues that had become common in other European and global states (Ciglioni 2017, 209). Italian attitudes toward nuclear weapons are characterized by the Italian ambivalence toward the entire ordeal. Ciglioni notes that Italian media and public opinion rarely expressed a forceful opinion either in support or in opposition to nuclear weapons. She writes that although the Italian public as a whole favored disarmament, there was no strong movement in support, as nuclear weapons were viewed as a foreign dilemma, one for other states to concern themselves with (Ciglioni 2017, 220-221). To note, Ciglioni's research primarily focuses on the Italian society of the early-mid 1960s, but with public opinion seen to be fairly static on the issue, this paper feels extrapolating her findings to characterize the mid-late 1950s to be appropriate. With an indifferent, uneducated public largely unconcerned with a growing nuclear movement worldwide, the domestic atmosphere could be perceived by the Italian government as conducive, or at least not hostile, to nuclear proliferation, opening the window for Italy's nuclear pursuit.

Having determined Italy's technological sphere to be capable of nuclear pursuit and ultimately nuclear proliferation and domestic conditions to be optimal for proliferation, an examination of Italy's place in the international system, the threats they faced and the alliances they valued, to determine whether, based on significant determinants of proliferation, Italy *should* have been a case of horizontal proliferation. For the Italian case, specifically looking at the 1950s as the period of possible proliferation, the significant negative determinant of being a signatory to the NPT cannot be considered as the NPT was not yet a treaty. As seen in other cases, the domestic politics of the time directly affect how Italy perceives itself as a possible world power and how it should proceed to regain a positive global reputation. With the political insecurity that marked Italian politics soon after World War II and the western influences that helped stabilize the system, the Christian Democrats sought to integrate Italy further into the Western world. One method of this was by working to be a founding member of the European Coal and Steel Community in 1952, but prior to this, the Italian government ensured that Italy would have a role in the common defense of Europe by signing the North Atlantic Treaty and becoming a NATO state in 1949 ("Italy and NATO – 1949"). By doing so, Italy ensured that it had become an integral part in the collective security organization designed to counter the growing Soviet influence and strength to Europe's east. With a nuclear United States now considering an attack on Italy as an attack on itself, necessitating a militarized response, Italy was under the extended deterrence umbrella of the American nuclear arsenal. Italy was also highly interested and involved in the nuclear-sharing program of NATO, being the first European country to have American IRBM nuclear weapons forward-deployed to their territory (Melissen 1994, 264). Being part of the newly-formed alliance and under the nuclear umbrella suggests that

Italy might have been comfortable forgoing proliferation, assuming they accept the credibility of the American deterrent.

The threat environment Italy faced was very stable. Unlike the case of the Asian states where the North Korean threat has proven unpredictable and erratic, the Soviet Union was a known quantity for the most part and Italy was not in the direct path of likely invasion like West Germany. Though global dispute or rivalry does act as a determinant for proliferation, so do Italy's rival being a nuclear state and Italy's not facing any conventional threats, both of which indicate that Italy should not pursue proliferation. While internal and technological conditions display optimal conditions for proliferation, Italy's role in the international system and its external determinants are not quite as clear. Drawing a theoretical conclusion as to whether Italy *should* or *should not* have proliferated is difficult in light of these conflicting determinants. Without a definitive answer based on this paper's theoretical structure, this paper is left to examine the history of nuclear weapons and Italy. Having been coded as pursuing nuclear weapons from 1955 to 1958, this paper accepts that, despite the inconclusiveness of the theoretical determinants, Italy did look toward proliferation. Understanding Italy's nuclear history will better allow conclusions to be drawn about whether the American security assurances guaranteed through the nuclear umbrella were *the* determining factor in Italy's nuclear reversal and ultimate non-proliferation.

Though Italy began their national nuclear program in 1952, it was not until 1955 that they pivoted toward considering weaponization and the pursuit of that goal. Italian nuclear pursuit is coded as initiating in 1955 because in that year, seeking an expansion of nuclear planning into the military realm, the Italian military created the Center for Military Applications of Nuclear Energy (CAMEN) (Nutti 1993, 119). The Italian government recognized the growing importance

of nuclear weapons in NATO's strategic and defensive planning and felt that proliferating could garner them greater authority in NATO decision-making. Italy also did fear the looming Soviet threat, but if power within the structure of NATO was the primary objective of proliferation, that would detract from the strength of the argument that American extended deterrence was responsible for their nuclear reversal. Up until the mid-1950s, the entirety of Italian foreign politics was concerned with reasserting the Italian state and regaining a sense of prestige to erase the historical memory of their involvement in World War II. By joining NATO, joining the United Nations in 1955, and working with the United States to gain authorization to independently re-arm, Italy was not only gaining back its security, it was gaining back its reputation as a reliable, prestigious state (Smith 1989, 380-382). If those in power at the time viewed the nuclear bomb as powerful beyond just as a weapon, but as a tool of diplomacy and a symbol of status, then the Italian nuclear pursuit would seem the next logical step in their quest to regain legitimacy among the global powers. It appears that, as Italy so willingly embraced the role of American nuclear weapons in NATO strategy and the practice of forward deployment through the nuclear sharing program, that in the absence of Italian proliferation, as their technology had not advanced to that point yet, the Italian government viewed hosting American nukes as a temporary status symbol until Italian proliferation was feasible. Italy's desire for American nuclear weapons to be deployed to their territory was not borne out security fears and the feeling that forward deployment granted them greater protection, but from a belief that hosting American weapons was another indication that they could once again be trusted and be allowed a voice in the issues of Europe and the world (Foradori 2014, 33).

The desire to be included in the new "big" discussions of nuclear weapons was likely the driving force behind Italy's nuclear interests. By looking toward proliferation, Italy was able to

guarantee itself the cooperation of the American nuclear forces and secure itself a prominent role in the NATO nuclear structure without having to expend massive amounts of capital in what was still a growing and developing economy (Nutti 1993, 123-124). Italy's nuclear pursuit represents a classic example of nuclear hedging, where the state pursues proliferation with the explicit intent of gaining commitments from a powerful ally, in this case the United States (Narang 2016/17; 118, 134). Italy was already a NATO state by the time it began its nuclear pursuit, meaning that it had already secured American extended deterrence protections through NATO's collective, common security protocols. Their pursuit was in search of greater commitments than just guaranteed protection, it was for involvement. Historians and researchers may reflect in hindsight and argue that this bargaining strategy, while effective at gaining Italy a greater involvement in the nuclear structure, did not bring Italy the prestige it had hoped for, but it would be difficult to dispute that the Italian government used its nuclear pursuit as a bargaining chip, not as a serious consideration for proliferation, a catalytic strategy similar to that seen in Japan (Foradori 2013, 34).

As mentioned, Italy successfully secured the forward deployment of American IRBMs through negotiations and bargaining that took place through 1958, with the weapons ultimately being deployed on Italian territory in 1959 (Nutti 1993, 125). In 1958, the short-lived tripartite FIG project aiming to establish joint nuclear weapons research between Italy, France, and West Germany collapsed when Charles de Gaulle replaced Pierre Gaillard as France's prime minister and ended French participation, effectively ending the program (Nutti 1993, 120-121). In that same year, Italy also transferred control of its research reactor located at Ispra to Euratom, to the protest of the Italian scientific community (Merlini 1988, 142). In conjunction, these three events signify the termination of Italy's nuclear pursuit and explain Bleek and Lorber's coding of all

native nuclear ambition ending in 1958. Evaluations of more recent Italian nuclear politics do indicate a great stress and importance placed on the credibility of the American security guarantees protecting Italy. Italy's accession to the NPT was absolutely contingent on the assurance of the protection granted by the American nuclear umbrella (Bunn and Timerbaev 1993, 12). This indicates that, historically, the American nuclear umbrella did play a great role in keeping Italy non-nuclear, but the nature of NATO's security agreements built that protection in prior to Italy's nuclear pursuit. These findings do support the notion that the American nuclear umbrella was an effective non-proliferation tool in the case of Italy. While Italy's explicit nuclear pursuit was based on more normative causes like the idea that nuclear possessions grants power and prestige, the security granted by American protections through NATO allowed that initial pursuit and were seen to be fully necessary to prevent Italian nuclear ambitions from resurfacing. Without the American security umbrella guaranteeing their security, the Italian government could have more seriously considered the possibility of fully proliferating and possessing an independent arsenal rather than just bargaining for a seat at the table.

Australia

The Australian exploration and pursuit of nuclear weapons provide valuable insight into state decision-making and the reasoning behind proliferation. Unlike other states examined, Australia's island borders are far removed from the great nuclear threats of the world, especially the Soviet Union during Australia's phase of nuclear ambition. Of course, geography did not and could not guarantee Australia security in the age where nuclear weapons could cover the globe, but by being so far removed geographically rather than right across the border like many other case studies discussed, geography can be considered to play a role. With the exploratory and pursuit phases both initiating and terminating at the same time, Australian nuclear ambition has

been coded by Bleek and Lorber as ranging from 1956 to 1973. By examining how the theoretical determinants for proliferation fit into the political history of Australia during this period, this paper can determine whether Australia *should* have proliferated per established proliferation theory and aim to find out why they ultimately did not.

Australia must be found to meet the industrial threshold of development established by Singh and Way to ensure that the Australian state was capable of proliferation during the coded period of ambition. Australia dedicated resources to developing a native steel production industry decades before their coded period of nuclear ambition. Having only been introduced to Australia around 1915, by 1940, the industry had grown sizably, producing over one million tons of steel (Wills 1950, 208). The industry continued to grow and modernize through the period being discussed in relation to nuclear ambition, allowing Australia to pass the threshold of domestic steel production. Through a wide variety of production methods, Australia is also seen to have surpassed the electricity generation capability established by Singh and Way's industrial threshold, allowing this paper to move forward in the consideration of the state's nuclear ambitions (Australia 2010). Though not included in consideration of determinants of proliferation, it should be pointed out that Australia possesses the largest known deposits of uranium in the world, which would in theory grant a native Australian nuclear program greater flexibility in proliferation as possessing domestic uranium stores removes one barrier to entry for possible proliferation (Biswas 2014, 164).

The period in which Australia is coded as exhibiting possible proliferation behavior is one marked by great economic growth and expansion for the state. The post-war Australian economy experienced a period of diversification and growth that would have allowed for the investment in nuclear infrastructure necessary for proliferation. The 1960s experienced an above-

average growth in GDP, largely due to a boom in population and the transition to an economy with a greater focus on manufacturing. Despite this growth, GDP per capita was still below OECD average for the period (Macfarlane 2002, 7). By exhibiting the necessary technological capabilities for proliferation and having a positive economic trend during the period of nuclear ambition, the conclusion can be drawn that the technological determinants as proposed by Singh and Way indicate a positive chance of proliferation for Australia. Greater evidence of the relationship between the Australian economic growth and their nuclear ambitions is the clear connection between the termination of the Australian economic growth and the termination of Australian nuclear ambition. Australia is found to have ended their nuclear pursuit in 1973, per the Bleek and Lorber coding adopted for this paper. The years 1972 and 1973 marked Australia's entrance to a period of economic stagflation, strangling the Australian economy and preventing growth at the rate that had previously been enjoyed and that had enabled nuclear ambitions. Rising unemployment paired with increasing inflation forced the Australian government to revamp economic policy, which can possibly have contributed to the reallocation of funds away from the nuclear program, marking the end of proliferation ambitions (White 1974, 62-63). Accounting for these technological determinants, they indicate a positive relationship between Australian economic growth and the Australian pursuit of an independent nuclear arsenal, but it is unlikely that a technological determinist model would fully explain the Australian nuclear pursuit.

Since its inception as an independent state composed of former British colonies in 1901, Australia has proven, even in its early years, a stable democracy. Although there have been plenty of political controversies and governmental changes, the notion that the Australian government functions as a liberal democracy has not been questioned since its formation

("Australian Democracy"). With democratic governments acting as positive determinants for proliferation, this would indicate that the internal political conditions of Australia during their period of proliferation could help explain the nuclear pursuit. Although an examination of domestic politics through the lens of political party and individual leaders has not been quantified in previous studies and cannot be used as a further determinant, reviewing the political history of the prime minister's office can serve to provide further context to the Australian nuclear reversal. From 1949 to 1972, the prime minister of Australia belonged to the Liberal Party. Only in 1972 did elections bring a Labor Party prime minister back into office, the first since 1949 ("Australia's Prime Ministers"). With a coded period of nuclear ambition ranging from 1956 to 1973, the entire period of pursuit took place under the oversight of a Liberal government, terminating as soon as Labor regained the majority and the position of prime minister. When discussing the history of the Australian nuclear program and its road to and move away from proliferation, special attention must be paid to the internal domestic sphere and the introduction of new dominant policies and ideologies that come with a change in controlling party.

Finally, evaluating the external determinants of Australia's nuclear proliferation will give a complete picture of the conditions that may have driven Australia to pursue an independent nuclear arsenal. The NPT came into effectiveness in 1970 and Australia acceded to the treaty as a fully-participating member just three years later in 1973. The Australian accession to the treaty marked the definitive termination of the state's nuclear ambition. The Australian government originally signed the agreement in 1970 while considering the possibility of keeping nuclear options on the table, but the Australian parliament fully ratified the treaty in 1973, ending the

hope of an independent Australian nuclear program (Warren 2019). This would suggest the legitimacy of the NPT as a significant negative determinant for proliferation.

The Australia, New Zealand, United States Security Treaty (ANZUS Treaty) formalized in 1951 will be seen as a prominent force and influence on the external conditions of Australia during the period of nuclear ambition. Signed only two years before the initial year of nuclear pursuit, the ANZUS Treaty served and continues to serve as a trilateral collective security agreement between the three titled states (Roberts 1972, 34). Belonging to a collective security alliance, especially one that provides coverage under an extended deterrence guarantee through a nuclear umbrella, should serve to deter proliferation, with each of those conditions being found to have a significant negative relationship to proliferation. Pursuing nuclear weapons despite being party to such a security agreement could indicate that other forces influenced the Australian decision pursue a nuclear arsenal. The Cold War was at its height during the coded period of nuclear ambition, allowing for the possibility that fear of an existential threat from an aggressive Soviet Union could drive the proliferation pursuit. ANZUS, during the early years of the alliance, proved to create a series of tradeoffs that the Australian (and New Zealand) governments were forced to consider in the face of the growing nuclear world. ANZUS provided nuclear coverage through deterrence over the states and would hopefully reduce any risk that they perceived, but their inclusion in the collective security arrangement necessarily tied them to the elevated risks of warfare inherent to such an agreement. Their aim to gain greater deterrence against possible threats had to be weighed against the possibility that their inclusion in ANZUS introduced a greater and otherwise unlikely enemy, representative of the entanglement that states fear when considering mutual security (Kelly 2018, 114). The looming threat of the Soviet Union and later a nuclear China, however unlikely a direct threat they may be for Australia beyond their

involvement in the ANZUS Treaty, would serve as a positive determinant for proliferation, possibly contributing to the push for proliferation.

For the final significant determinant of proliferation, Australia has demonstrably been involved in nuclear sharing agreements, which in theory, should positively contribute to their proliferation. Between 1945 and 2000, fully covering the coded years of nuclear pursuit, Australia was party to 25 nuclear sharing agreements (Fuhrmann 2009, 26). Australia also played an integral role in the proliferation of the United Kingdom, hosting the 12 of the UK's atmospheric nuclear tests on their territory, largely Western Australia, between 1952 and 1957 ("The United Kingdom's..."). Involvement in nuclear sharing serves as another significant positive determinant.

The exploration and pursuit of nuclear weapons by the Australian state are seen to have initiated concurrently in 1956. In the earliest years of Australian nuclear pursuit, the government strongly considered forgoing their independent development, a major, though surmountable, economic, technological, and infrastructural hurdle by looking to purchase a ready-made nuclear arsenal from their ally, the state they had acted as a nuclear guinea pig for, the United Kingdom. First proposed among leading Royal Australian Air Force staff, the idea for an Australian nuclear deterrent initially depended on the transfer of weapons from the British arsenal to the RAAF. Between 1956 and 1959, pushed by the nuclear desires of the Air Force's commanding officers, Australian Prime Minister Robert Menzies repeatedly approached the British with proposals for nuclear transfer, often reluctantly and personally questioning the necessity of an independent arsenal. In 1959, the conservative faction of the Australian nuclear pursuit, with Menzies at the helm, declined to further pursue a British nuclear weapon, seemingly ending the possibility of nuclear transfer and instead forcing Australia to construct a native nuclear program if it were to

develop a deterrent (Walsh 1997, 3-6). Menzies had already rejected the prospect of indigenous nuclear proliferation in 1957, citing an American attitude hostile to possible Australian proliferation and likely considering the vast expense of such an endeavor (Reynolds 1998, 872).

Rapid, drastic changes in the Australian security environment in the 1960s led Australia to reconsider its decision to forgo a native nuclear weapons program and once again look toward nuclear pursuit. Proliferation concerns in the eastern hemisphere became a much more concerning matter for Australia in 1964 when China declared itself a nuclear power and demonstrated its nuclear capabilities. Along with the more immediate threat of a Chinese nuclear arsenal which directly resulted in Australian officials calling for the reconsideration of an independent Australian nuclear arsenal, Australian political leaders looked to the withdrawal of British military from Singapore and Malaysia and the later decline in American involvement in Vietnam as further reason to pursue proliferation, as two key strategic allies were greatly reducing their power presence in the region, leaving Australia more responsible for fending for itself (Walsh 1997, 9-11). More local disputes also caused Australia to question the American commitment to defense through the ANZUS Treaty. As tensions between Australia and Indonesia rose in the early 1960s following Australian support of Malaysia in the Malaysia-Indonesia confrontation, Australia recognized that the United States would hesitate to intervene in a conflict between Indonesia and Australia, prioritizing the maintenance of the non-communist Sukarno government over its ANZUS commitments (Frühling 2013, 21).

Beyond the external security environment that may have been seen to necessitate a nuclear pursuit to better allow Australia to become self-reliant in its defense, changes in government within Australia also played a large role in a reinvigorated nuclear pursuit in the late 1960s. Following the death of Prime Minister Harold Holt in late 1967, John Gorton rose to

power and began to take Australia down the path of proliferation. Gorton had been vocal in his distrust in the credibility of American and British security guarantees, likely informing his view that Australia required an independent nuclear arsenal (Walsh 1997, 11). The declaration of Nixon's Guam Doctrine in 1969 provided greater political cover for Gorton's nuclear pursuit, justifying that Australia must become more self-reliant in its defense through the development of nuclear capabilities (Frühling 2013, 22). Gorton, knowing the unpopularity of the nuclear pursuit, instead tried to sell the idea based on economic growth and development the nuclear project could offer, an economic nationalist posture focusing on indigenous fuel production that could take advantage of Australia's vast uranium stores (Hymans 2000, 11). Disregarding the popular sentiment against nuclear proliferation among most Australians, Gorton oversaw the Australian Atomic Energy Commission's push toward developing uranium enrichment infrastructure. Although Australia under Gorton reluctantly signed the NPT in 1970, the treaty was not ratified, allowing Gorton to continue to his nuclear aspirations. Though Gorton was replaced as prime minister by his party mate William McMahon in 1971, a traditionalist opposed to Australian nuclear ambitions, the final blow to the Australian nuclear pursuit occurred in 1972, when a nuclear technology deal between Australia and France collapsed, preventing Australia from acquiring necessary enrichment technologies, following the Labor majority victory in the 1972 elections, the first majority turnover since 1949 (Hymans 2000, 12). The new Australian government strongly opposed Gorton's nuclear pursuit and ratified the NPT in 1973, signaling the termination of Australia's nuclear ambitions as denoted by Bleek and Lorber's coding (Walsh 1997, 13).

The case of Australia's nuclear reversal does not seem to align with this paper's hypothesis that the American nuclear umbrella acted above all other factors in convincing an

allied state to forgo nuclear proliferation. The nuclear pursuit looks to have been largely internally driven, centralized around a single prime minister who utilized his position and advisors of similar belief to pursue a nuclear project that was unpopular and unwanted by the majority of Australians. A localized view of Australia's nuclear pursuit shows that it was as much a personal pursuit as a national endeavor. Hymans categorizes Gorton as an oppositional nationalist, which this paper's discussion of Hymans' theory work recognizes as the personality category most suited for proliferation pursuit (Hymans 2000, 12; Potter and Mukhatzhanova 2008, 142-144). This rejection of greater external security threats as motivation for proliferation is seen by the immediate nuclear reversal as soon as the Labor party gained the majority and the prime minister's seat. If an existential security threat necessitating proliferation were driving Australia toward nuclearization with a justified security model explanation, the need to proliferate would almost certainly have been recognized by members of both parties. Instead, many even within Gorton's Liberal party opposed his nuclear ambitions. The Australian government may have had credible concerns over America's commitments to its extended deterrence promises, but no such external threat existed that would require proliferation.

Another factor that detracts from the viability of a nuclear umbrella-based explanation of Australia's nuclear reversal is that there were no major changes in the American extended deterrence nuclear posture between the end of Gorton's tenure and the Australian ratification of the NPT. If the United States had taken steps to strengthen its commitments and demonstrate its credibility to Australian security, a stronger argument could be made for its role, but no such changes occurred. The incredibility American assurances used by Gorton to justify nuclear pursuit must have been seen by the succeeding government as credible enough to renounce all nuclear weapons pursuit. Beyond considerations of the credibility or incredibility of the

American nuclear umbrella, the role of norms in the international system has gained support as being a likely cause of Australian reversal. Even when Gorton was in office, Australia signed the NPT, yet did not ratify. Gorton was left little choice after other major latent nuclear states and proliferation candidates such as West Germany and Japan signed the agreement. Australia's signing of the NPT just one week after Japan did so suggests that fear of being outcasted in the international system for being noncompliant with the growing norm of non-nuclear states accepting their non-nuclear status and forgoing proliferation (Walsh 1997, 12). Tempering even Gorton's nuclear ambitions, the emergence of new anti-proliferation norms through the participation of powerful non-nuclear states in the NPT can be seen as having a major role in Australia's nuclear reversal and the further development of this norm likely influenced the Labor party's decision to so quickly ratify the agreement once coming into power.

The role of the American nuclear umbrella as a tool for non-proliferation in the case of Australia's nuclear reversal should not be entirely discounted. The assurance and accepted credibility of American nuclear commitments remained an important facet of Australia's security structure. Without those commitments, Australia may have continued its nuclear ambitions. However, during the period of Australia's nuclear pursuit, the structure of American extended deterrence did not shift so radically as to necessitate and then obviate an independent Australian nuclear deterrent. Instead, variations in the domestic Australian political sphere drove Australia to its nuclear path and further variation in politics and international views on proliferation rendered the Australian nuclear pursuit unwanted. American extended deterrence has been a key factor in keeping Australia free of nuclear weapons but a more focused look at the individuals in charge of the nuclear pursuit in the style of Hymans show more specifically domestic political

changes to be most likely responsible for Australia's nuclear reversal and the termination of nuclear ambitions in 1973.

France

On February 13, 1960, a French-made nuclear weapon exploded in the Algerian Sahara Desert. This "Gerboise Bleue" nuclear test announced to the world that France was now a nuclear state and propelled the French to a greater, more involved role in the calculations of European and global security ("Gerboise Bleue'..."). This test also eliminated the need for French reliance on the American nuclear umbrella as a means of deterring Soviet nuclear aggression; an independent French nuclear arsenal, even in its earliest days, would allow France to ensure its own security. This case study aims to provide a counter to the previous examples, where the involved state ultimately underwent nuclear reversal and forewent independent nuclear proliferation. This case demonstrates an instance where American extended deterrence assurances through its nuclear umbrella were unsuccessful in preventing allied proliferation. Such an example is, by the nature of the extreme rarity of new states proliferating, especially for American allies, a unique perspective on the shortcomings of the American nuclear umbrella as a tool for nonproliferation. In that same way, a single case may be informative but it cannot be taken as representative of the path other American allies may take toward proliferation. Examining the conditions of the coded determinants of proliferation during the three distinct phases of proliferation will allow a better understanding of why the French government decided to advance at each step and why France successfully proliferated where others reversed their nuclear course.

Unlike many of the other cases examined where the exploration and pursual phases of proliferation are concurrent, Bleek and Lorber indicate three distinct phases for France's path to

proliferation. France is seen to begin exploring their nuclear options immediately following World War II in 1945. This exploration does not escalate into nuclear pursuit until 1954. Finally, with the successful nuclear test, France can be coded as achieving nuclear acquisition in 1960. With respect to the minimal technological threshold established by Singh and Way, this paper does not need to delve into French technical capacity. French technical capability was exhibited by their actual proliferation; therefore, this paper accepts that France met that threshold without investigation. The following examination of the technological, internal, and external determinants followed by a review of France's nuclear history will allow a complete understanding of why France is now a nuclear state while all others discussed by this paper have remained latent.

Though French industrial capacity soon returned to pre-war levels following the end of World War II, massive redevelopment for the faltering economy was necessary. France received approximately 21% of the total funds paid out as part of the Marshall Plan, amounting to approximately \$2.7 billion in that period (Tarnoff 2018, 2, 8-9). Because of the quick capitulation of the French to Nazi Germany when invaded, the industrial capacity of the state was not nearly as devastated as other states examined in this paper. Entering the period of nuclear ambition at an already high level of development relative to the world would indicate that France would likely not realize its nuclear ambition through the successful weaponization of nuclear technology. However, history shows this theoretical prediction to have not been fulfilled, therefore a technological determinist approach would not explain French proliferation.

The period of French nuclear ambition was mainly encompassed by the democratic French Fourth Republic as government. Lasting from 1945 to 1958, the government of this time was characterized by consistent instability in the cabinet. This government collapsed in 1958

when the National Assembly dissolved itself by vote with the intention of instituting a new constitution, largely in response to the French government's inability to properly respond to the crisis in its Algerian colony (Huber and Martinez-Gallardo 2004, 27). This government was an open, liberal, free democracy according to its Polity IV rating. The French Fourth Republic was replaced by the French Fifth Republic, the system that remains in place to this day. Charles de Gaulle was brought out of retirement to take power and oversee the installation of a new democratic system. Despite the Polity IV rating showing a brief decrease in democracy, the French Fifth Republic is also a democratic institution. Through both of these governments, the democratic character is consistent with what would be expected for a state that ultimately proliferated. Charles de Gaulle is a key figure in the history of French nuclear proliferation. Along with one of his predecessors, Pierre Mendés-France, who held the office of Prime Minister for just eight months in 1954 and 1955 but played a prominent role in determining the course of French nuclear proliferation, he will be examined to a greater extent at the individual level through the lens of Jacques Hymans' leadership characterization as part of the historical review, displaying the key role individual leaders played in France's nuclear pursuit.

For the case of French proliferation, the external determinants of proliferation will prove to be the most important. Historical analysis will indicate that the response of individual French leaders to the external security environment of France and post-war and Cold War Europe, both in relation to the threat from their rivals to the east and the perceived support, or lack thereof, from their allies to the west, drove the pursuit of proliferation.

The external determinants of French proliferation are similar to those seen in the case of West Germany. France held a prominent position in the structure of the NATO security alliance, aiming to balance the power of European security with the Soviet rival to the east. France later

withdrew from NATO in 1966, rejoining in 2009, but was a participating member at the time of proliferation. Though a nuclear threat such as the Soviet Union would normally be understood to deter a state from proliferating due to the fear of preventive or preemptive attack by that nuclear rival, the presence of the American nuclear umbrella and extended deterrence assurances gave France greater leeway to pursue an independent nuclear arsenal. The NPT did not exist at this time so it will not be considered as an external determinant.

The coding of these variables presents a mixed perspective of whether or not France was a likely candidate to proliferate. One important distinction between the situations of France and West Germany is most telling in why France was successful in proliferating where West Germany was not. The fear of abandonment by the United States was not as strong for the French as it was for the West Germans (Monteiro and Debs 2014, 24). This is evidenced by the fluidity in the assigning of France a positive value for the rivalry determinant. Singh and Way in their paper that has served as the foundation for this paper code France as not being involved in an enduring rivalry at the time of proliferation (Singh and Way 2004, 875). However, they recognize and discuss the validity of other means of coding that would accept coding France as being part of a rivalry, as was done by this paper due to French participation in the collective security of Europe through the defense structures of NATO, entangling France in the rivalries and possible aggression of their fellow member states. The Soviet Union saw a nuclear-armed West Germany as an immediate threat to its own security. Positive substantive steps toward independent proliferation by West Germany beyond their collaboration with France and Italy would have likely been cause for Soviet aggression. This, paired with American threats of abandonment if Germany further pursued a nuclear weapon, was in turn a great threat to Germany's own security. With American nuclear umbrella no longer providing extended

deterrence due to abandonment, West Germany would have been unable to defend itself against a large-scale Soviet preventive strike. However, as Monteiro and Debs recognize, a French nuclear arsenal was not viewed in the same manner as a West German nuclear arsenal by the Soviet leadership.

A nuclear France was not an existential threat to the Soviet Union, therefore aggressive preventive action would be unlikely. Recognizing this, French leaders were undeterred by American threats of abandonment. Abandonment holds little weight when the protégé state has no cause to fear aggression from a rival state. This represents the key failing of the American nuclear umbrella as a tool for non-proliferation. Protégé states under the umbrella must feel an existential threat if abandoned by the United States. Once the protégé is comfortable and secure that no rival state will act aggressively to prevent their proliferation, the negotiating power of the patron state wielding the nuclear umbrella as its bargaining chip is severely undercut. The proceeding historical analysis will more clearly display how this theoretical understanding of nuclear bargaining and the power of the nuclear umbrella in encouraging proliferation ultimately resulted in France becoming the fourth nuclear-armed state in the world in 1960.

Bleek and Lorber indicate the French exploration of nuclear weapons began in 1945, just months after the country's liberation and the end of the war in Europe. In a later essay, Bleek provides greater detail as to this coding. In 1945, the French Atomic Energy Commission (CEA) was established with a joint purpose, both to oversee the development of a new civilian nuclear energy industry in France and to examine the future possibilities of French weaponization of the atom (Bleek 2017, 11). The CEA and the nationalized French utility company EDF worked in tandem to provide nuclear-generated electricity to the French people while covering the secret movement toward an independent French nuclear arsenal (Hecht 1996, 484). With the first

nuclear reactors coming online in France in 1948, the French nuclear infrastructure had plenty of time to develop the necessary technological capabilities and expertise before proceeding to the next stage of proliferation (Mendl 1965, 22). The step into nuclear pursuit was taken by PM Pierre Mendés-France, who in 1954 authorized a government report to determine how long the French nuclear industry could continue covertly working toward weaponization under the guise of civilian-energy-focused research before the extent of the research would reveal their nuclear ambition. This report found 1957 to be the latest the French nuclear pursuit could be kept secret, coinciding with the actual date of the first official recognition of the nuclear ambition by the French government (Mendl 1965, 25-26).

With French nuclear ambitions public knowledge, the French government was granted greater freedom to use their impending proliferation as a tool for negotiation a greater stake in the defense of Europe and ensuring their interests and security were assured. This was seen in the aborted effort to coordinate a joint nuclear force between France, Germany, and Italy, discussed in previous case studies, that de Gaulle terminated all French participation in upon assuming power. Although de Gaulle is often seen as the force behind the French proliferation effort due to his involvement in the 1945 establishment of the CEA and his oversight of the successful independent proliferation from 1958 through the end of his tenure, proliferation was largely popular in France throughout the period of the Fourth Republic and the decision to explode a nuclear weapons was not de Gaulle's; Félix Gaillard in 1958 approved the planning for a 1960 nuclear explosion prior to the fall of his government and the Fourth Republic, de Gaulle simply re-affirmed that position (Mendl 1965, 28; Tertrais 2004, 55). With this decision, France rejected the shelter of the American nuclear umbrella, determining its fate as an independent nuclear power, and succeeded in their 1960 nuclear explosion, announcing their nuclear capabilities to

the world, although a fully-functional nuclear deterrent capability would not be available until 1964 (Pelopidas 2015, 86).

Multiple explanations have emerged as to why France was determined to pursue a native nuclear capability, forgoing the protection afforded it by the American nuclear umbrella in favor of an independent arsenal. This paper will discuss three explanations, allowing for an understanding of the French perception of proliferation and the ability and power proliferating would afford, to better understand why the case of France has ended so differently from the others discussed. The first is a basic security model approach, as presented by Bruno Tertrais (2011): French leaders determined American security assurances to be incredible, resulting in their belief that the only way to ensure the security of France was through an independent, French-controlled deterrent capability. Tertrais in a different piece presents a more comprehensive overview of French proliferation, which will be featured in support of the third explanation. The second explanation concerns the perception of France and the prestige of nuclear weapons states in the international system, as supported by Scott Sagan (1996). Did the idea that great powers should possess nuclear weapons drive French proliferation, with French leaders holding the belief that France deserved to be recognized as a great power, therefore proliferation was necessary? The third explanation, argued by Mendl (1965), Monteiro and Debs (2014) and Pelopidas (2015), includes elements of the first two, arguing that France proliferated to give itself the freedom to act unilaterally both in cases of its security and in other diplomatic situations.

The reason why France felt it necessary to develop an independent nuclear deterrent, their *force de frappe*, is best exhibited by one question asked by Charles de Gaulle to Dwight Eisenhower in 1959, “Will they [future U.S. presidents] take the risk of devastating American

cities so that Berlin, Brussels, and Paris might remain free,” (Sagan 1996, 77). This represents the logic of the first explanation, a simple security model explanation, but also will be later used to justify the stance this paper holds, that of the third explanation listed. France needed to ensure its own security and from this perspective, the American security assurances were not enough. French leadership believed American extended deterrence to not be credible, believing that no American president would put American cities and American people in danger, likely subject to nuclear attack, in response to a direct attack only on France. Unless American interests were directly involved, there could be no credible threat of an American retaliatory strike (Tertrais 2011, 2-3). Scott Sagan rejects the notion that France’s nuclear ambitions were driven by concerns of state security. Instead, he offers the explanation that nuclear possession lends a degree of prestige to the nuclear possessor state that was sought by French leadership, especially de Gaulle. He cites that France was not in a position to fear immediate attack by the Soviets or any other rival during this period, meaning concerns over the credibility of the American nuclear umbrella would have been largely unimportant. The French nuclear arsenal was seen by the French government as a shortcut to restoring the prestige of the French state in the international system and regaining the status and power France enjoyed prior to World War II. Deterrence against Soviet aggression was not the causal factor for French proliferation, but rather a subsequent justification once the project was already underway (Sagan 1996, 77-79).

The third explanation of French proliferation is the most compelling, including arguments made by both of the first two explanations to describe French nuclearization as not just being driven by immediate security concerns or by a desire to be seen as a great power, but to have the independence to act as the great power they believed themselves to be. With an independent arsenal, France would have a greater voice in the security of Europe as a whole. France would

not be beholden to the United States for its security, granting freedom to pursue their own interests without a fear of abandonment inherent to the nuclear patron-protégé relationship. The leverage of the patron state provided by their extended deterrence promises is erased when the protégé proliferates, rendering the assurances unnecessary. Through this explanation, France both takes matters of security into its own hands, eliminating the need to rely on the United States or any other foreign actor, and establishes itself as a global power to be contended with on all matters.

The Suez Crisis was seen as a catalyst for the French desire for independence from its allies in NATO. The UK and France viewed the American response to the Suez crisis as a betrayal, one undercutting the credibility of the United States as an ally, especially one that would endanger itself to nuclear aggression in defense of its French ally through extended deterrence arrangements (Pelopidas 2015, 90). This event demonstrated the need for France to be able to act unilaterally, which the development of a nuclear arsenal separate from the structure of NATO would better allow. Even if one accepts the credibility of American extended deterrence in nuclear conflict, France believed that the United States was uninterested in protecting the more far-reaching political interests of France that may come into conflict with America's own interests, therefore France could no longer rely on the USA for security (Monteiro and Debs 2014, 24).

Nuclear proliferation allowed France to achieve two goals. Proliferation represented the resurgence of the powerful French state. Proliferation represented modernization of the French military, hoping to shed the image of its defeat in World War II and regain a role as a major world power (Mendl 1965, 33). Coinciding with the end of France as a colonial power and its disastrous efforts to hold colonies such as Algeria or Vietnam, the nuclear pursuit would re-

establish the prestige of France to the world; international efforts would require the consideration of French interests and input as a nuclear state (Tertrais 2004, 61). Gaining this prestige and perceived power is one thing, but actually possessing the ability to utilize it is another. This is the second goal accomplished by French proliferation. By maintaining a nuclear arsenal strictly independent of all international agreements and security alignments, France had guaranteed its sovereignty, protecting its ability to act in its own best interest. In nuclear sharing arrangements or extended deterrence agreements, France would be bound by the need to appease its nuclear patron, which would almost assuredly be the United States. France could not be certain that its interests would always align with those of the United States and could not risk future French policy being determined as to how best protect American interests in order to safeguard its security arrangements rather than by what is in the best interest of France itself. This consistent desire for the ability to act independently is evidenced by the French rejection of the logic behind proposed multi-lateral force arrangements and the ultimate withdrawal from NATO in 1967 (Tertrais 2004, 59-60).

French proliferation was a function of French independence. This independence manifested in the assurance of its own security and subsequently granted it the prestige of a nuclear weapons state, but neither of these were the primary motivations. French proliferation constituted a rejection of European integration in military affairs and a rejection of multilateralism in the command and control of nuclear weapons. With this attitude and motivation driving proliferation, the American nuclear umbrella was unsuitable as a tool for preventing the creation of an independent French deterrent capability. This would be a French nuclear arsenal to be controlled by the French only to be used for the French in order to protect

all interests, be it security, diplomatic, economic, or other, of France, a desire the American nuclear umbrella was unable to fulfill.

Conclusions

The validity of extended deterrence has been questioned and challenged for as long as the policy has existed. Theorists and politicians struggle to accept the leap of faith necessary to view an extended deterrence posture in a nuclear world as credible. Extensive qualitative, quantitative, and historical research has been conducted to determine once and for all whether extended deterrence truly deters rival states from acting on their aggression and whether extended deterrence relationships can in a nuclear world be seen as credible. The answers found throughout this research range from a resounding “no” to a resolute “yes.” The very fact that extended deterrence relationships continue to exist today, when, in the anarchic international system, each state must be foremost concerned for its own well-being, displays that the theory and practice must still be relevant in some capacity. Whether or not the rival is truly deterred, the protégé sees the assurances as credible, and the patron intends to uphold their assurances despite incurring costs within their own state do not change the fact that extended deterrence as perceived by the global community has a role in shaping international relations and international security. For that reason, it is absolutely vital that research continues to delve into how extended deterrence is put into practice and achieved, credibly or not, in the world today.

This paper demonstrates the specific conditions necessary for the American nuclear umbrella to be sufficient in deterring allied nuclear proliferation and the conditions in which a state will proliferate despite an extended deterrence relationship with the United States. The five cases of South Korea, Japan, West Germany, Italy, and Australia are used to demonstrate instances where the American nuclear umbrella was successfully used to prevent an allied state

from achieving successful nuclear acquisition, preventing further horizontal proliferation. The case of France is used to understand how in certain conditions, the nuclear umbrella cannot be used to deter states from proliferating; in such cases, other modes of diplomacy and policy must be utilized in order quell nuclear ambitions. Understanding the circumstances of either the nuclear reversal or the nuclear acquisition of each of these case study states is vital to constructing and instituting proper American nuclear policy to uphold its goal of preventing global proliferation.

The cases in which the United States successfully wielded its nuclear umbrella as a tool for enforcing allied non-proliferation can be broken into two categories. The first is the positive use of the umbrella, where recommitments and assurances of American credibility, seen through a variety of policy adjustments, from verbal commitments from American presidents to forward deployments of nuclear weapons to that state's territory, are used to convince the nuclear-ambitious state that independent proliferation is unnecessary. By reassuring its ally that the United States is committed to the active defense of all its allies, the state will then view their security situation as stable and secure, removing the need for proliferation. The second category of successful non-proliferation policy is the negative use of the nuclear umbrella, namely abandonment. Successful nuclear proliferation is a drawn-out, time and resource-consuming process, even between a state's first successful nuclear test and the deployment of an arsenal capable of fully deterring enemy aggression. American abandonment in response to allied proliferation would leave that state unprotected during this period, unable to deter enemy aggression while the security dilemma tells us that this would be the most likely period for an enemy to attack. Negative use of the umbrella prevents allies from proliferating because once abandoned while in the process of nuclearization, that state becomes a target.

In both of these cases, the state must be relatively weaker than the United States and weaker than its rival state for the nuclear umbrella to be sufficient. If the state is capable of operating completely independently of the United States without risk to its own security and if the state is capable of proliferating while still maintaining an advantage in capabilities over its rival, then the nuclear umbrella will not be successful in deterring proliferation. Positive use of the nuclear umbrella is successful in cases where states are not committed to proliferating. This paper would consider positive use of the nuclear umbrella to be successful in the cases of Japan and Italy. It is likely that in these cases, states are not immediately threatened and do not have an immediate existential fear. As each of these cases occurred during the Cold War, there were of course nuclear rivalries and threats that encompassed the globe. However, these states were unlikely to be primary targets, although independent proliferation may have made them so. These states may explore the possibility and pursue an opportunity, but their security does not rely on their proliferation. In contrast to using the nuclear umbrella as a tool for preventing proliferation, states in this position used the threat of proliferation to gain stronger assurances and greater security within the alliance. By increasing assurances to these states and allowing them greater involvement in their own defense through nuclear sharing agreements or just a greater voice in the nuclear posture for that relationship, these states can be relatively easily deterred.

Negative use of the nuclear umbrella is successful in deterring proliferation when the threat of abandonment causes the state to fear its own immediate security. In these cases, a nuclear rival is likely an imminent existential threat to the state pursuing proliferation, which if abandoned, would be subject to preventive strikes in order to stop their nuclear pursuit. These states require the cover of the nuclear umbrella to proliferate, so once that cover is removed,

proliferation is no longer a feasible option. Although fears of abandonment or concerns over the lack of credibility of American security assurances may simultaneously drive a state's nuclear pursuit, that same fear of abandonment prevents the state from being able to do so. The negative use of the American nuclear umbrella is seen in the cases of South Korea and West Germany. If abandoned during their nuclear pursuits and if these states then continued to work toward proliferation, it is a strong possibility that their nuclear-capable rivals, China and the Soviet Union respectively, would have attacked to prevent successful proliferation. These states have no choice but to rely on American extended deterrence for their security and the threat of abandonment is a strong tool in enforcing the American posture of non-proliferation among allies.

The cases of France and Australia demonstrates that in some instances, neither positive nor negative use of the nuclear umbrella can be used to either encourage or deter a state from proliferating. For this to happen, two important conditions must be met. Like in the case of positive use, the state must not perceive an immediate existential threat if it were to be abandoned by the United States during the proliferation process. However, unlike the positive use cases, proliferation must be viewed as an absolute necessity for the state. In these instances, like the case with France, the nuclear weapon is likely viewed to serve a purpose beyond the security benefits it grants. There must be a greater desire for nuclearization otherwise the positive use would assuage any concerns over security. When a state holds ideological reasons for proliferation beyond its own immediate security, the nuclear umbrella cannot be viewed as a tool to deter proliferation because it inherently cannot fulfill those desires. Holding up a nuclear arsenal as a symbol of power and prestige in the global community is only possible if the arsenal is your own. In these cases, other methods like strict and crippling sanctions must be used in

order to prevent a state from proliferating if the state does not reverse course on its own. As seen by the case of Australia, where nuclear ambition was driven by the personal considerations on an individual leader at the time, the American nuclear umbrella can be an ineffective tool for promoting non-proliferation when security is not the key concern. Australia's nuclear reversal was a result of domestic politics, the change in leadership to a government averse to nuclearization. If Australia had stayed the nuclear course following internal political changes, it is unlikely that the neither positive nor negative use of the nuclear umbrella would have effected change in Australian ambition. Other modes of punishment would have been necessary to deter proliferation, otherwise Australia could have followed the French model of proliferation.

This type of study is limited by the small numbers of states that have even held nuclear ambitions, let alone the even smaller number of states that have successfully proliferated. Each case study presents a view into the why a state pursues nuclear weapons, but one must also consider the uniqueness of each case. Lessons learned from one may not be directly applicable to another or to a future state working toward proliferation. The view of nuclear use has also radically shifted in the time since the final nuclear reversal discussed in this paper. The Cold War is over. The bipolar nuclear dynamic that once defined the world order no longer exists. While that may be a cause for comfort for some states like the now-unified Germany, the emergence of new nuclear states, especially the unpredictable rogue state of North Korea, may relight nuclear ambitions in countries like Japan and South Korea. Although the global nuclear order has been reshaped, this paper feels that there being only one instance of allied nuclear proliferation among numerous latent states that have forwent proliferation is evidence enough to accept the hypothesis presented. This paper can conclude that the United States has been successful in its

use of the nuclear umbrella as a tool for encouraging and enforcing non-proliferation among its allies.

These findings mirror and reaffirm the findings of previous research in this field, both quantitative and qualitative, that have similarly determined the success of the nuclear umbrella in deterring proliferation. Bleek and Lorber (2014) use quantitative methods to refute previous studies arguing that the nuclear umbrella has been irrelevant in allied state's non-proliferation. They determine the umbrella to have played a significant role in enforcing nonproliferation among allied states, a conclusion reflected by the work of this paper. The findings of this paper most firmly align with those of Monteiro and Debs (2014). Their research reaches similar conclusions over the differing conditions under which different uses of the nuclear umbrella are found to be successful and unsuccessful. Terming the approaches as "carrots" (positive use) and "sticks" (negative use), their research demonstrates how the relationship of the protégé state to both its patron and its rival and the protégé state's view of its own security situation and of nuclearization is fundamental in determining which approach would be successful (Monteiro and Debs 2014, 24). This paper views itself as specifically reaffirming their findings and suggesting their conclusions regarding how the United States should proceed in non-proliferation efforts to be valid.

Looking Forward

Turkey

The ongoing democratic backslide under President Recep Tayyip Erdoğan has brought Turkey to the forefront of discussions concerning modern American extended deterrence policy, forward deployment of American nuclear weapons, and the risk of allied horizontal proliferation.

In October of 2019, President Erdoğan, in a speech to Turkish government leaders, lamented the unfairness of the global nuclear order upheld by the NPT, arguing it unfair for some countries to be permitted to possess nuclear weapons while others are forbidden from doing so and referring to this arrangement as “unacceptable,” (Sanger and Broad 2019). These comments have raised questions and concerns over the security of American nuclear weapons stationed in Turkey and of native nuclear ambitions. Bleek and Lorber’s coding indicate that Turkey never seriously explored or pursued nuclear weapons in its history, but the nuclear attitudes of Turkish leadership may be changing. As relations between the United States and Turkey continue to strain, internal political unrest, Turkish regional aggression, and the emergence of possible nuclear ambition may force the United States to reconsider its security partnership with an ally key to America’s presence in the Middle East. In doing so, as demonstrated throughout this paper, American policymakers must carefully consider the reasoning and motivation of why Turkey would seek independent proliferation before determining a course of action to counter these nuclear ambitions.

Turkey is coded as having American nuclear weapons forward-deployed on their territory since 1959 (Fuhrmann and Sechser 2014, 466). In 1957, American Honest John missiles were deployed to Turkey, with their nuclear warhead tips sent in 1959, completing the forward deployment. In subsequent years, the United States further deployed various nuclear weapons to Turkey as a means of bolstering its extended deterrence posture during the Cold War and ensuring the Soviet Union perceived the American threat as credible while also containing any nuclear ambitions from the NATO-aligned Turkey (Lynch 2019). The current nuclear stockpile deployed on Turkish territory is well below its Cold War height, but with the power potential of each nuclear weapon, any deployment is significant. Current estimates hold that approximately

50 American B61 tactical nuclear gravity bombs are housed at Incirlik Air Base. However, the Turkish Air Force does not currently possess the training nor the technological capability to access or utilize these weapons and the United States does not maintain any aircraft capable of nuclear-armed missions in Turkey either, rendering these bombs relatively useless for combat scenarios (Bugos 2019).

The 2016 attempted coup aimed at removing President Erdoğan, amplified by the assistance of aircraft from Incirlik in the attempted coup, refueling fighter jets that were used to bomb the Turkish Parliament, and the subsequent arrest of the base commander, stoked fears over the security of American nuclear deployments in Turkey (Lewis 2016). This attempted coup prompted the Obama administration to draw up plans for the removal of those nuclear weapons, but the plan was never carried out (Sanger and Broad 2019). In 2017, Turkey agreed to purchase the Russian-made S-400 missile defense system against the wishes of the United States, further highlighting how relations between the two have deteriorated (Bugos 2019). More recent Turkish aggression, marked by its invasion of Syria, have also strained the American-Turkish relationship, furthering opposition to these nuclear deployments. Turkish military forces fired artillery on American military positions and invaded Syria in order to attack Kurdish forces, long-time American allies. These actions again prompted governmental planning into the removal of the nuclear weapons at Incirlik, and again no action was taken (Sanger 2019). The American nuclear weapons stationed in Turkey are in a state of limbo; the continued deployment of these weapons creates a heightened security risk as relations between the two states, despite their NATO alliance, erode, but withdrawing the weapons may spur the independent proliferation pursuit that Erdoğan has hinted at. Determining the cause of the Turkish nuclear

desire may shed light on what American policy should be regarding these 50 B61 nuclear weapons and what other actions can be taken to prevent independent Turkish proliferation.

Why would Turkey desire nuclear weapons independent of the extended deterrence structure of the United States provided through NATO? It is possible that Turkey fears for its security and desires an independent nuclear arsenal strictly for its deterrent capabilities. As seen by the purchase of Russian missile defense technology, Russia is unlikely to be perceived as an immediate nuclear threat to Turkey. Instead, a nuclear Iran would drive Turkish security concerns, possibly resulting in proliferation. When the United States withdrew from the Joint Comprehensive Plan of Action, the Iran Deal, in 2018, the door for Iranian proliferation was reopened. The JCPOA had installed safeguards against a nuclear Iran, temporary as they were, but with the withdrawal of the United States and the reinstatement of sanctions, Iran began to disregard the restrictions placed upon their nuclear fuel production, reenabling their proliferation pursuit (Sanger and Broad 2020). Just a year later, Erdoğan made his statements arguing for possible Turkish nuclearization. It may be that these two events are related.

If nuclear weapons are seen to be central to Turkish security, why would American extended deterrence and nuclear deployments not alleviate their security concerns? Turkey may look to the history of nuclear weapons in their territory and conclude that American commitments to Turkish security to be incredible, necessitating an independent arsenal. The withdrawal of Jupiter missiles from Turkey as part of a secret trade between the United States and the USSR to bring an end to the Cuban Missile Crisis could inform this supposed lack of credibility. Although the United States maintained stockpiles of other nuclear weapons systems in Turkey after the withdrawal of the Jupiters, this proved that deployments of nuclear weapons were not permanent (Stein 2016). Forward-deployed nuclear weapons could serve as bargaining

chips in negotiations centered on American security, possibly disregarding the security of the host state. In the same line of thinking that drove France to proliferate, Turkey and other states are left to consider whether the United States would leave nuclear weapons stationed in their territory if withdrawing them would better serve American security. Credibility of American nuclear assurances have been further undermined by the lack of nuclear-capable aircraft actually stationed in Turkey. In their current state, the tactical nuclear weapons at Incirlik are unusable unless the United States were to fly in planes from another country to pick up the bombs. The United States of course maintains multiple ways of ensuring nuclear retaliation against attacks on allies beyond just those 50 gravity bombs, but the messaging in rendering these weapons largely unusable may detract from the credibility of American will to use, not ability to use, their nuclear capabilities. Turkish politicians, if they believe that nuclear deterrence is vital to their security, can understandably conclude that to ensure the protection of the Turkish state, an independent nuclear capability would be needed.

Even before the collapse of the JCPOA, Iran was seen to factor heavily in the security calculations of Turkey. The development of missile technology posed a security threat to Turkey prior to Iran achieving possible nuclear latency. The presence of other weapons of mass destruction in the region, chemical and biological weapons stored and used by both Iran and Syria present pressing security concerns for Turkey, as well. Nuclear weapons may be vital to maintaining parity between the regional rivals due to these WMDs, even if Iran does not achieve nuclear proliferation (Kasapoğlu 2015, 95-96). Reviews of the Turkish security environment throughout the 2010s also highlighted the presence of nuclear weapons in Turkey as a deterrent against Syrian aggression, but they serve in this purpose to a much lesser extent than they would in deterring a nuclear-armed Iran. Other oppose the view of Iran and Syria as immediate threats

to Turkish security, threats necessitating nuclear capabilities. A 2013 poll exploring the security threats Turkey was facing at the time found that both the Turkish public and their community of security experts perceived “‘military intervention by the U.S. or Israel in order to prevent Iran from getting nuclear weapons’ as a greater threat to Turkey than ‘Iran gaining nuclear weapons.’” Instead, the presence of Kurdish separatists in Turkey was seen to be the greatest security threat facing Turkey at that time (Varnum 2015, 189). The 2019 aggression against Kurds in southern Turkey and Syria while having taken no concrete steps to facilitate an independent nuclear program while further straining already-tense relations with its nuclear patron uphold this view, calling into question how seriously Turkish officials view nuclear weapons as critical to state security.

A second interpretation of Turkish nuclear ambitions, one rejecting security concerns as the primary motivator for proliferation, looks toward prestige and independence granted by an indigenous nuclear program successfully proliferating. This interpretation would closely follow the French model of proliferation previously discussed. Erdoğan’s own comments regarding Turkish proliferation are very telling of the attitudes toward proliferation, providing possible insight into his motivation. Beyond referring to the established nuclear order with further proliferation barred as unfair, he concluded the current nuclear order to be “unacceptable” and justified his own possible nuclear ambitions by saying “There is no developed nation in the world that doesn’t have them,” a demonstrably untrue claim (Toksabay 2019). This sentiment would seem to imply an issue other than security motivating Turkish possible future nuclearization. Like Charles de Gaulle, Erdoğan fits the mold of an “oppositional nationalist” leader as described by Jacque Hymans, the category most willing to pursue nuclear weapons. Like France and accepting the argument of Varnum, Turkey does not appear to be immediately

concerned about its security from a nuclear threat. Of course, that can change as the nuclear situation in Iran is ongoing, but for now, it would appear Turkey's security environment is not threatening enough to justify immediate proliferation. Like France, Turkey may be unhappy with its role in the alliance, as seen by recent moves to look toward Russia for new technology and directly combatting American military efforts in the region, and wants to establish itself as a prestigious, powerful state worthy of an international voice.

This paper believes that if Turkey were to pursue nuclear weapons, the evidence supports the second interpretation of Turkish nuclear ambitions as voiced by Erdoğan as the motivation why. If this is correct, the American nuclear umbrella is unlikely to play a great role in deterring Turkey from pursuing proliferation. Turkey, if it decides to proliferate with Erdoğan at the helm, would be looking for a type of power and influence that only an independent nuclear arsenal can grant; the American nuclear umbrella simply cannot provide what Turkey would be searching for. Attempts at bolstering American credibility through reaffirming assurances or even further nuclear deployments would not be advisable methods for curtailing the Turkish nuclear pursuit. Instead, more punitive measures must be taken, including stringent sanctions aimed at crippling Turkish economic power, therefore leaving the state unable to afford its nuclear pursuit, may be a better course of action. It is highly unlikely that Turkey would actually pursue nuclear weapons and successfully proliferate, as so few have done in history. Varnum, as quoted by Sanger and Broad (2019), argues that these comments by Erdoğan are aimed only at stoking anti-American sentiments that have become increasingly popular among his supporters and that he would not be foolish enough to incur the massive economic and reputational punishments from actual nuclear pursuit. This paper agrees with this sentiment and finds it highly unlikely Turkish nuclear ambitions advance beyond incendiary rhetoric. However, with a nuclear-latent state like Turkey

and a personalistic, authoritarian leader in charge, the United States must be prepared to immediately react to and counter advances made toward successful Turkish nuclear proliferation.

Closing

The United States emerged from World War II in a position of global power and influence unlike any other in American history. Through an array of diplomatic and military tools, the United States shaped the post-war global order and defined the Cold War world through its policies. Among these tools was its nuclear umbrella, wielded as both carrot and stick, convincing and coercing allied states to forgo their own independent nuclear proliferation. This paper has examined a series of historical cases where the United States utilized the power of its nuclear umbrella in attempts to prevent allied proliferation, each during the Cold War period, where any further proliferation could prove destabilizing to the bipolar system that had emerged from the ruins of the Second World War.

This paper has seen in the cases of West Germany and South Korea how threatening abandonment and the removal of security assurances under the umbrella successfully prevented the proliferation in states who felt existential threats from their nuclear neighbors. The cases of Italy and Japan have shown how the bolstering of security assurances and the reaffirmation of American commitments can be enough to satisfy the nuclear ambitions of states already more comfortable in their security, where one's own nuclear ambitions may simply be a strategy for gaining that strengthened security. France and Australia represent instances where the American nuclear umbrella may be helpless to stop proliferation, where states seek advantages beyond security in their nuclear pursuits and claim to be willing to accept the cost of proliferation in order to recognize those gains. The divergence in these cases can be attributed to domestic factors, with changes in government bringing changes in attitude toward nuclearization in one

while commitments to proliferation remained steadfast in the other. As the situation progresses in Turkey and the Middle East, we will be left to see which category Turkish nuclear ambition ultimately falls under. The United States continues to play a great role in the security of allies across the globe, all of which will over time necessarily re-evaluate their own security and determine the value America provides. It is likely that an allied state in the future will begin exploring its own nuclear options. Understanding the motivations and goals driving an allied state's nuclear ambition will be crucial to properly formulating the future American diplomatic and political response to prevent further proliferation and move one step closer to a world out from under the nuclear Sword of Damocles that hangs over us all.

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Appendix

Bleek and Lorber's 2014 "Proliferation behavior over time" Coding

Country	Explore	Pursue	Acquire
United States	1939-	1942-	1945-
Russia	1942-	1943-	1949-
United Kingdom	1940-	1941-	1952-
France	1945-	1954-	1960-
China	1956-	1956-	1964-
Israel	1949-	1955-	1967-
South Africa	1969-91	1974-91	1979-91
Pakistan	1972-	1972-	1987-
India	1948-	1964-66, 72-75, 80-	1987-
Korea, North	1962-	1980-	2006-
Yugoslavia	1949-62, 74-87	1953-62, 82-87	
Brazil	1966-90	1975-90	
Korea, South	1969-81	1970-81	
Libya	1970-2003	1970-2003	
Iran	1974-79, 84-	1989-	
Iraq	1976-91	1976-91	
Germany	1939-45		
Germany, West	1957-58		

Japan	1941-45, 67-70	
Sweden	1945-70	
Switzerland	1945-69	
Norway	1947-62	
Egypt	1955-80	
Italy	1955-58	
Australia	1956-73	
Indonesia	1964-67	
Taiwan	1967-76, 87-88	
Argentina	1978-90	
Romania	1978-89	
Algeria	1983-91	
<p>Note: Coding appendix (42 pp.) available on request. Coding based on multiple, high-quality secondary sources for every case listed above, and a number of others deemed as not meriting inclusion on the basis of those sources.</p>		